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ABSTRACT

This final report discusses the activities and outcomes of a project that addressed three challenges to improving outcomes for young children with disabilities: (1) a current and thorough synthesis of the knowledge base, (2) the effective translation and dissemination of this information for families, practitioners, and administrators, and (3) an understanding of policy and systems change support necessary to implement and sustain high quality services. In Phase 1, the knowledge base was synthesized by critically reviewing the extant literature, gathering the subjective views of 388 stakeholders, and synthesizing this knowledge base into 240 recommended practices. In Phase 2, the project developed and disseminated products in preferred formats for maximum suitability, prepared and field-tested products, disseminated the recommended practices nationwide, and provided regional and national training. In Phase 3, the project identified and incorporated training and systems change strategies to establish sustainable change in the quality of services for young children with disabilities and their families. The project also prepared six peer reviewed manuscripts for publication and video and Web-based products to accompany the print products produced in Phase 2. Appendices include: Figures; Literature Review Coding Forms; Manuscripts; Products, Web Site and Training; and Focus Group Recommendations. (Contains 17 references.) (CR)

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SYNTHESIZING AND DISSEMINATING RECOMMENDED PRACTICES IN EARLY INTERVENTION/EARLY CHILDHOOD SPECIAL EDUCATION

(OSEP, Directed Research Projects, CFDA 84.324D–Focus 6)

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Final Performance Report

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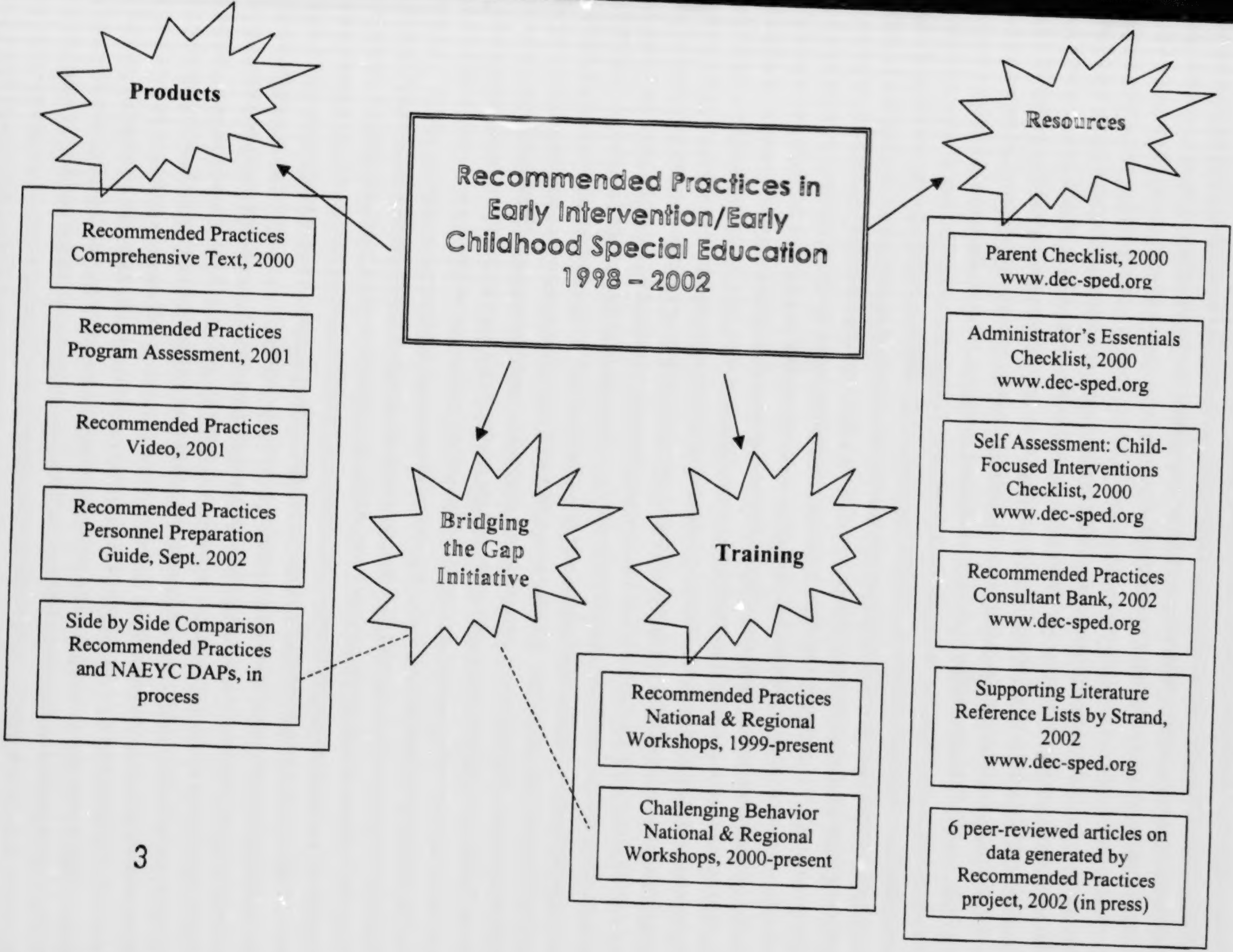

Recommended Practices in Early Intervention/Early Childhood Special Education 1998 – 2002

Products

- Recommended Practices Comprehensive Text, 2000
- Recommended Practices Program Assessment, 2001
- Recommended Practices Video, 2001
- Recommended Practices Personnel Preparation Guide, Sept. 2002
- Side by Side Comparison Recommended Practices and NAEYC DAPs, in process

Bridging the Gap Initiative

Training

- Recommended Practices National & Regional Workshops, 1999-present
- Challenging Behavior National & Regional Workshops, 2000-present

Resources

- Parent Checklist, 2000 www.dec-sped.org
- Administrator's Essentials Checklist, 2000 www.dec-sped.org
- Self Assessment: Child-Focused Interventions Checklist, 2000 www.dec-sped.org
- Recommended Practices Consultant Bank, 2002 www.dec-sped.org
- Supporting Literature Reference Lists by Strand, 2002 www.dec-sped.org
- 6 peer-reviewed articles on data generated by Recommended Practices project, 2002 (in press)

SYNTHESIZING AND DISSEMINATING RECOMMENDED PRACTICES IN EARLY INTERVENTION/EARLY CHILDHOOD SPECIAL EDUCATION

I. EXECUTIVE SUMMARY

Research in EI/ECSE has reported practices that can improve outcomes for young children with disabilities (DEC, 1993; Guralnick, 1997). However, the widespread adoption of these recommended practices has been hampered by three challenges: a) a current and thorough synthesis of the knowledge base, b) the effective translation and dissemination of this information for families, practitioners and administrators and, c) an understanding of policy and systems change supports necessary to implement and sustain high quality services.

This project addressed all three of these challenges to improving outcomes for children with disabilities, ages birth through five years, through three objectives or phases. **Phase 1**: Synthesized the knowledge base by critically reviewing the extant literature, gathering the subjective views of stakeholders and synthesizing this knowledge base into 240 recommended practices. **Phase 2**: Developed and disseminated products in preferred formats for maximum usability; prepared and field-tested products; disseminated the recommended practices nationwide; and provided regional and national training. **Phase 3**: Identified and incorporated training and systems change strategies to establish sustainable change in the quality of services for young children with disabilities and their families requiring on-going and purposeful strategies. By building partnerships with two local programs and obtaining a model demonstration grant from OSEP, we have continued our efforts to create systems change. We have prepared six peer reviewed manuscripts for publication and video and web based products to accompany the print products produced in Phase 2; disseminated systems change and administrative strategies necessary for the sustainable adoption of recommended practices; and collaborated with national stakeholder groups to provide training and information to their constituents who represent key consumer groups.

II. TABLE OF CONTENTS

PROJECT OVERVIEW & CHALLENGES 4

CONCEPTUAL FRAMEWORK 6

METHODS AND PARTICIPANTS 8

RESEARCH FINDINGS 14

PROJECT IMPACT: Discussion, Products and Dissemination 19

GOALS, OBJECTIVES AND ACCOMPLISHMENTS 24

ORIGINAL PROJECT TIMELINES 32

TABLE ONE: Number of Articles in Each Peer-Reviewed Journal Included in DEC Research Synthesis 35

TABLE TWO: Number and Percent of Articles Interpreted By Coders as Having at Least One Recommended Practice by Method 38

TABLE THREE: Number and Percent of Articles by Research Method Employed and Recommended Practices Strand Placement 39

TABLE FOUR: Number of Articles by Method and Publication Year 40

TABLE FIVE: Number and Percent of Articles Reporting Disability Categories of Child Study Participants by Year 41

TABLE SIX: Number and Percent of Articles Reporting Severity of Disability by Year 43

TABLE SEVEN: Number and Percent of Articles Reporting Study Setting Data 44

TABLE EIGHT: Number and Percent of Articles Reporting Family Income and Education Levels by Year 45

REFERENCES 46

APPENDIX A: Figures

APPENDIX B: Literature Review Coding Forms

APPENDIX C: Manuscripts

APPENDIX D: Products, Web Site and Training

APPENDIX E: Focus Group Recommendations

III. PROJECT OVERVIEW & CHALLENGES

This project has been a collaborative effort between the Council for Exceptional Children's Division for Early Childhood (DEC), the University of Colorado-Denver, the Louisiana State University Medical School, and the University of Wisconsin-Milwaukee to update, expand and validate the DEC Recommended Practices in Early Intervention and Early Childhood Special Education. The second goal has been to disseminate the practices and to conduct systems change and training activities to improve the likelihood that the practices are adopted by local programs to improve services to young children with disabilities and their families.

This report details the project objectives, activities, accomplishments and outcomes. In addition, administrative accomplishments included: fiscal and personnel arrangements, executed subcontracts to the Louisiana State University Medical Center (LSUMC) for the literature review activities, and with the University of Wisconsin-Milwaukee (UWM) for the field validation study. We established a cross-site Management Team consisting of the P.I. (Smith), the three investigators (Sexton, McLean, Sandall), the strand chair coordinator (Odom), and the three methodology consultants (Snyder, Strain, Thompson). Management by objectives procedures were put into place, regular Management Team conference calls held, at least two face-to-face Management Team meetings held yearly, attended the OSEP Research Directors meetings, and all fiscal/budget matters were monitored. All the experts in the field that had offered in the proposal to chair recommended practices strands, agreed to carry out that activity – Bruder, Wolery, McWilliam, Santos & Thomas, Salisbury, Stremmel, Harbin, Miller & Stayton, Dunst & Trivette, Bagnato & Neisworth (see Appendix A). All strand chairs and consultants contracts were executed.

Two unforeseen factors occurred affecting our timelines and some proposed procedures. First, the number of research articles that met our criteria for inclusion far exceeded our expectations. Therefore, the number of articles to be reviewed and coded required more volunteer coders than we had anticipated, and a longer time frame for the literature review activities. We had proposed to be completed with the literature review phase by the beginning of the third quarter of Year 01. In order to achieve this, we requested supplemental funding to hire more staff and to provide stipends to coders in order to enforce a short turn around. Our request was denied and we were advised to modify the work scope in some way as an option. Therefore, rather than delete key planned activities which we felt would jeopardize the integrity of the literature review and synthesis, we, modified four activities and the time line to allow for completion of the literature review by the fourth quarter. The four modifications were: 1) to include articles that were published through 1998 vs. 1999; 2) not to compute effect sizes as part of the coding process, 3) to conduct the synthesis by the Investigators reviewing all recommended practices in a strand and combining where possible to produce a feasible number of practices for the field to implement, then having the strand chairs validate the synthesis (vs. a delphi technique); 4) initial data entry was confined to the limits of the originally proposed data entry vs. an expanded data set capable from the coding sheets. Data from the generic coding sheets (not related to the specifics of the study methodology) and the recommended practices were entered for all articles returned by coders. These recommendations were made by the project's Management Team as not necessary to the integrity of the project and yet impacting on the time frame. However, the project subsequently received supplemental funding to conduct analyses of the expanded data set which was achieved and is reported in this report.

The second unforeseen occurrence was the sudden death of Dr. David Sexton in

November of 1999. Dr. Sexton was the Principal Investigator on the LSUMC subcontract at the time of his death. The focus of the LSU subcontract was the literature review. Completion of the data entry was affected by approximately one month. Additional data entry on the second level of review (specific of the study methodology) was postponed. In February, 2000, Dr. Pat Snyder was named Principal Investigator for the LSUMC subcontract and work resumed on the second level data entry. While these events affected the literature review by several months, all other major activities have occurred on time.

IV. CONCEPTUAL FRAMEWORK

For over 30 years, literature in Early Intervention/Early Childhood Special Education (EI/ECSE) has reported strategies, methods and tools for improving the developmental and educational outcomes for young children with disabilities (Guralnick, 1997; Meisels & Shonkoff, 1990; Tjossem, 1976; White, Mastropieri, & Casto, 1984). Previous efforts to synthesize the EI/ECSE knowledge base have been limited. For example, in the 1980s researchers employed meta-analytic techniques to synthesize the early intervention efficacy literature (Casto & Mastroprieri, 1986; Casto, White, & Taylor, 1983); however, large bodies of relevant research (e.g., single-subject and qualitative studies) were not included in the synthesis (Dunst & Snyder, 1986; Strain & Smith, 1986).

Another effort to summarize the EI/ECSE knowledge base, sponsored by the Division for Early Childhood (DEC) of the Council for Exceptional Children (CEC), was begun in 1991. Recommended practices in fourteen areas, called "strands", were generated by groups composed of researchers, practitioners, representatives from higher education, and families. These practices were subsequently validated by a national sample of 500 individuals representing these stakeholder groups. The resulting list of 405 practices, first published in 1993 in a DEC document (DEC Task Force on Recommended Practices, 1993) was later followed by a book (Odom & McLean, 1996) that further explained the practices. Although this effort was generally well received, a number of concerns with the 1993 effort signaled the need for a more systematic and comprehensive synthesis of research and practices in EI/ECSE (Garland, 1995; Wolery, 1995). First, the 1993 DEC practices were derived solely from stakeholder focus groups; no systematic review of the scientific literature was conducted. Therefore, many of the original 405 practices recommended by DEC were not based on empirical research but on the values and experiences of individuals involved in the work groups. Subsequently, readers of the 1993 document or the 1996 book are unable to determine which practices have empirical support and which are values-based. Second, the reports and book generated from this effort were not produced in user-friendly formats and consumers reported there were too many practices to be useful in quality improvement efforts. Third, the recommendations only addressed direct services and personnel development. There were no recommendations for administration or policy support necessary for the delivery of quality direct services. Finally, the landscape of EI/ECSE has changed significantly since DEC's work on the original recommended practices project. The number of preschool programs has grown dramatically, empirical research has expanded, services are provided in more inclusive settings, partnerships with general early childhood education have grown, and all states are participating in Part C of the Individuals with Disabilities Education Act (IDEA) (birth to three programs).

In addition to updating the practices, it was recognized that there was a need to use more rigorous methods for producing a set of recommended practices in order to increase the likelihood of their adoption and implementation at the child, family, and systems levels. These improved methods included: reviewing the research literature for practices that result in improved outcomes; conducting focus groups of parents, practitioners, administrators, and scientists to ascertain their beliefs and values about practices that result in improved outcomes; synthesizing these sources of information; producing recommendations for "indirect" practices or supports such as personnel preparation and policy and systems change activities necessary for the implementation of recommended practices with children and families; and increasing the awareness and use of the recommended practices by disseminating the practices through user-friendly products, engaging in training activities, and collaborating with partner national organizations for dissemination to key stakeholder groups such as families, early childhood educators, and administrators.

V. METHODS AND PARTICIPANTS

The procedures used to compile the recommended practices were accomplished in three stages. Stage One involved identifying recommended practices through focus groups and a comprehensive literature review. In Stage Two, practices developed in the focus groups were synthesized with practices generated from the literature review. Stage Three involved a field validation of the synthesized practices.

The project employed a mixed-method design with an emphasis on integrative approaches. From the beginning, a Management Team of eight researchers was established to ensure that all decisions were subjected to expert review and represented a consensus of opinion.

Stage One: Identifying Recommended Practices

Experience-based practices: focus groups. In 1998-1999, focus groups were conducted in an effort to gather practices based upon participant experiences. Four categories of focus groups were held to generate the recommended practices that stakeholders believed were important for improved outcomes for children and families. Focus groups were organized by role (a) experts by topic strand, (b) families, (c) administrators, and (d) practitioners.

The scientific expert focus groups were organized by nine topic strands and were conducted during the 1998 DEC annual conference in Chicago by strand chairs selected for their extensive and recognized work in their particular area. The nine strand categories were determined a priori according to whether they reflected direct services or indirect supports. The six direct services strands were child-focused practices, cultural/linguistic sensitivity, family-based practices, interdisciplinary models, learning environments, and technology applications. The three indirect support strands were personnel development, policy/procedures, and systems change/leadership. The strand chairs selected up to 10 individuals with expertise in their area to serve as focus group members (Greenbaum, 1987).

The Management Team met with the strand chairs before the focus groups to review the purpose of the groups and to establish general procedures for generating practices. Strand chairs developed a definition of their strand prior to conducting the focus groups to help guide the group and provide a focus for the discussion. Agreement on the format for stating practices was reached. Finally, follow-up procedures and timelines for conducting the focus groups were determined. Each focus group lasted approximately 2 hours and was audio taped. The direct-services focus group members were asked to list the practices in the strand topic area that have been shown to produce positive outcomes for children birth through 5 years or their families. The focus groups for the indirect supports of systems change, policies and procedures, and personnel development were asked what practices in these areas support the delivery of direct services. The practices generated by the focus groups were subsequently compiled by the strand chairs using the audio tapes to supplement table notes or to produce transcripts. The practices were then mailed to each member of the focus group for review and verification and then submitted to the Management Team. After finalizing the lists of practices, the Management Team decided to add a strand on assessment, combine the policy/procedure strand with the systems change strand, and synthesize the learning environments and cultural/linguistic practices across all other strands and practices. This Management Team decision, which was also supported by the strand chairs, was based on a consensus opinion that assessment issues had not been addressed adequately in some strands but were redundant across others. Secondly, it was decided that practices in the learning environment and cultural linguistic strands were identified and appropriate across all other strands. This initial experience based synthesis resulted in seven final strands of recommended practices: five direct services--assessment, child-focused practices, family-based practices, interdisciplinary models, technology applications, and two indirect supports--personnel preparation, and policies, procedures and systems change. The resulting practices generated by the scientific expert focus groups formed the corpus of information that was ultimately judged against the support generated by the literature and the stakeholder focus groups.

The categories of stakeholders for the three experience based focus groups were families, practitioners, and administrators. These stakeholder focus groups were also conducted during the 1998 DEC conference and followed the same procedures described above. Following each focus group, the recommended practices generated by the group were summarized by the focus group facilitator who was one of the project investigators. This summary was sent to each focus group member for review and verification. The practices from each focus group were subsequently organized by topic strand with all of the recommendations from the stakeholder and scientific expert focus groups categorized, depending on their topic, and placed into one of the seven strands (e.g., child-focused, family-based, etc.).

Research-based practices: literature review. Empirically based research published in peer-reviewed professional journals from 1990 through 1998 was included in the literature review. Forty-eight journals relevant to the field of EI/ECSE were selected and reviewed. Of these, forty five were determined to have articles that contained research findings with implications for practice (see table 1). First, the tables of contents for all 48 journals from 1990 to 1998 were reviewed by project staff. Second, the article abstract for each article was reviewed to determine if the article met the criteria for inclusion in the study. The criteria were that the article must be an empirical study of an intervention provided to children with disabilities, birth through 5 or their families or those who serve them. Each article that passed this initial screening was then analyzed for major aspects of research design and results. Analysis of the articles was accomplished by having individual coders read articles and complete two coding sheets for each article.

A generic coding sheet (Form A) was used uniformly across all articles. This coding sheet and was designed to record the following information: article title, authors, journal, year, general description of participants (children with disabilities, families of children with disabilities, etc.), gender of participants, mean age, ethnicity, disability, severity level of disability, educational level of family members, income level of family members, and study setting. A specialized coding sheet (Form B) designed specifically to highlight additional information about research rigor based on the method used in the articles was also completed. Coding sheets for group quantitative design, single subject design, descriptive/survey design, qualitative design, and mixed method design were used. The specialized coding sheets were developed by the project's methodology consultants to ensure that each article was appropriately reviewed according to the research method used in the article. The information on the specialized coding sheets included variable identification, research design features, sample, setting, outcome measures, duration of intervention, findings, recommended practice(s) supported by the study, and the strand that the recommended practice reflected. A main purpose of the specialized coding sheets was to help the coder evaluate the scientific rigor of the article and subsequently lead the reviewer to the recommended practice(s) supported by the article (see Appendix B for coding sheets).

Forty-two first stage coders were trained, and inter-coder agreement was established with a methodology consultant. Coders had to read and code an article(s) and establish an inter-coder agreement level of at least 85% with a methodology consultant before formal article coding began. Following training, coders were assigned articles to read and code according to the generic and specialized coding sheets. Twenty-nine additional, or second stage, coders read approximately one-third of the articles ($\underline{n}$ = 360) that had been coded by a first stage coder and independently coded the articles as to the recommended practice(s) and strand placement generated by the first coder. When discrepancies occurred between the two coders, the article was reviewed and read by two members of the Management Team and a consensus was reached about the recommended practice and strand placement. This occurred for less than 5% of the articles reviewed.

The initial number of articles included in the review was 1,018. Fifty-four percent ($\underline{n}$ = 550) of the articles reviewed reported a group quantitative design, 21% ($\underline{n}$ = 210) single subject, 14% ($\underline{n}$ = 142) descriptive/survey, 11% ($\underline{n}$ = 109) qualitative, and 1% ($\underline{n}$ = 7) mixed method. After review, or as a result of the validation process, 183 articles were excluded because the research conducted did not lead to a recommended practice or after further review the article did not meet the original criteria for inclusion in the study, resulting in a final set of 835 articles.

Stage Two: Synthesis of Experience and Research

Practices generated from the scientific expert focus groups served as a baseline of reference from which to examine the support available to individual practices from the empirical literature and from stakeholder focus groups. To accomplish this task, the stakeholder focus groups and the literature review were combined (synthesized) within each strand by the project investigators (See Appendix A). This synthesis combined similar practices, deleted duplications, and added new practices to subsume groups of similar practices. All decisions were made by consensus among the investigators. These lists of practices by strand were submitted to participants in several sessions at the 1999 DEC conference for review and comment and were subsequently reviewed by the strand chairs and project investigators for final verification. The number of practices after the synthesis was 250.

Stage Three: Field Validation of Practices

After synthesizing the recommended practices produced from the focus groups and literature review, the final list of 250 practices were subjected to a national field validation. The validation stage included two steps: (a) verification among experts, and (b) performance of a national survey described below. Verification among experts involved a review of the final list of practices and supporting articles by the strand chairs as well as a review by the project investigators.

Second, the list of 250 practices was formatted into a questionnaire for field validation. Due to the large number of practices, two forms of the questionnaire were created by assigning odd-numbered items to Form A and even-numbered items to Form B. Each respondent received either Form A or Form B with 125 practices to validate. Respondents used a Likert-type scale with ratings of strongly agree, agree, disagree, strongly disagree, or undecided for whether the practice should be a recommended practice in Early Intervention/Early Childhood Special Education. Respondents also used a Likert-type scale to indicate how often the practice is used, rating frequently, sometimes, rarely, never, or undecided.

DEC members, parents, and higher education professionals and administrators were the three groups that comprised the validation sample. Initially, the groups consisted of volunteers who responded to requests at the annual DEC conference and to a notice in *Young Exceptional Children* to participate in the field validation. Additional participants were identified to increase the sample. After including the volunteers and randomly selecting members from the DEC membership list, the first group consisted of 400 DEC members. The second group consisted of 200 parents, which included the volunteers and individuals identified by the DEC Family Consortium and also individuals randomly selected from the mailing list of members of the Federation for Children with Special Needs. The third group was comprised of 200 individuals in higher education and administrative positions in Early Intervention/Early Childhood Special Education, which included volunteers and individuals randomly selected from the list of Part C and 619 Coordinators from each state. This resulted in a final list of 800 people participating in the validation study.

Questionnaires were mailed to participants. The initial mailing to respondents was followed one month later by a postcard reminder with a second postcard reminder mailed approximately 1 month after the first. After 38 surveys were returned blank, the original sample of 800 people was later changed to 762.

VI. RESEARCH FINDINGS

The final number of recommended practices by strand is as follows: assessment 46, child-focused 27, family-based 17, interdisciplinary models 19, technology applications 22, personnel preparation 66, and policies, procedures and systems change 43. Over 70% of the recommended practices on the final list are supported by some combination of the three sources, with over 65% of the practices having literature support from at least one empirically based research article.

Experience-Based Practices: Focus Groups

The stakeholder focus groups (family members, administrators, and practitioners) generated 145 recommended practices. As described previously, practices generated in the stakeholder focus groups were first grouped into the strand topics then synthesized with practices developed in the scientific expert focus groups. During the synthesis it was discovered that some of the practices generated in the stakeholder focus groups applied to more than one recommended practice on the final list. Subsequently, the total number of practices generated in the three stakeholder focus groups that were used to support the recommended practices on the final list was 158. After combining similar practices from the three focus groups and synthesizing these practices with the final list, 96 (40%) of the recommended practices on the final list were supported by practices that emerged from at least one of the stakeholder focus groups. Most of the practices generated by family members fall into the family-based and the policies, procedures, and systems change strands. Not surprisingly, the majority of practices generated by administrators fell into the policies, procedures, and systems change strand. Practitioners generated nearly twice the number of practices as did the family members and administrators, with the majority of practices falling in the policies, procedures, and systems change, family-based, and personnel preparation strands.

Research-Based Practices: Literature Review

The number of articles derived from the initial screening was 1,018. The final number of articles included in the review was 835. Articles (183) were excluded by coders if the research conducted did not lead directly to a recommended practice, the article did not meet the original criteria for inclusion in the study, or a coder and a methodology consultant determined that the article did not meet the projects' scientific standards to merit inclusion (e.g., case studies had been incorrectly determined to be single subject design studies). Of the 835 articles coded, 54% (*n*=450) employed a group quantitative design, 22% (*n*=184) used a single subject design, 15% (*n*=121) used descriptive/survey designs, 9% *(n*=74) qualitative designs, and 1% (*n*=6) used mixed methods. Table 2 shows the final number of articles with research findings interpreted by coders as having implications for recommended practices by research method.

The total number of recommended practices derived from the 835 articles reviewed was 1,453. This total number of recommended practices exceeds the number of articles reviewed because according to the coders, some studies generated evidence that produced more than one recommended practice. Table 3 shows the number and percent of articles according to the research methodology employed and the recommended practice strand assigned by the coder. For example, 399 articles supported the Child-Focused strand. One hundred and eighty-seven (47%) of those articles used a group quantitative method, 158 (40%) used a single subject design, 38 (10%) a survey/ descriptive design, 12 (3%) qualitative approaches and 4 (1%) used mixed-method design. Literature support for practices were noted 977 times across the seven strands and across the five different methodologies. This number is higher than the actual number of articles (835) because some articles contained more than one practice and at the same time supported two or more strands in the judgment of the coders. Further review of Table 3 shows that: (a) a disparity exists in the amount of empirical research that supports the various practice strands and, (b) regardless of practice strand, group quantitative methods were the predominant research method employed during 1990-1998 in this EI/ECSE research.

Table 4 displays the study methods employed by articles by year. For instance, group quantitative methods were used in 41 (54.7%) of the 1990 articles, while single subject and descriptive/survey designs were used in 14 (18.7%), qualitative in 6 (8.0%) and mixed methods were used in no articles that year. There is a general trend towards increased numbers of articles employing qualitative methodology over the 9 years. The use of single subject methodology increased from 1990 to 1998 but varied with each year. Group quantitative methodology remained the highest percentage method used across all years.

Tables 5 through 8 depict analyses of the Form A data. Table 5 shows the number and percent of articles that reported the disability category of child study participants by year. The "other" category included coder comments such as: "at risk for developmental disability", neurologically impaired", "fetal alcohol syndrome", "spina bifida", "sick preemies". The coders were instructed to code the disability category as defined by the article. Therefore, there were categories or subcategories that were not on the coding sheet. The coders coded these under "other" rather than make an interpretation.

Table 6 shows the number and percent of articles reporting the level of severity of disability of child study participants by year. These data show that on average 53%-73% of articles report the severity of disability with the percent declining over time from 73% in 1990 to 55% in 1998.

Table 7 shows the number and percent of articles reporting the study setting. For the study setting variable, no explicit definitions were offered to coders. Instructions were to code what the author(s) reported as the setting of the study. The setting options for coders on Form A were: home, hospital/clinic, inclusive/integrated classroom, segregated classroom, or other.

Initially the "other" category contained nearly 40% of the responses. Two project staff reviewed the entries in the "other" category and agreed to (a) distinguish "survey/interview" (15.8%), and "not clear" entries (2.4%); (b) add "separate" to the segregated classroom category for entries that described settings that are segregated but not a classroom ("speech lab", "OT room", etc.); (c) create a new category of "experimental settings/separate from peers" for entries that described the study setting as "experimental setting", "quiet room", etc.; and, (d) add entries related to "community" to the "inclusive/integrated" category. Table 7 shows that nearly half of the research settings in this EI/ECSE literature between 1990-1998 were home or hospital/clinic. Less than 20% of studies were conducted in inclusive/integrated classrooms or community settings.

Table 8 reports the number and percent of articles by year that reported income level and education level of families in the study. There do not appear to be any trends in these data. Income level is reported between 19-26% of the time and education level between 20-30% of the time in the EI/ECSE literature included in this effort.

Analyses of data from the individual specialized forms (Forms B) are found in Appendix C which contains manuscripts submitted for publication and provide: 1) complete description of the literature review, 2) analysis of the single subject design research articles, 3) analysis of the group quantitative design research articles, 4) analysis of the qualitative design research articles, 5) analysis of the interdisciplinary articles, and 6) analyses of the field validation study.

Field Validation and Final Recommended Practices.

A return rate of 51% (n = 388) was obtained (211 DEC members, 55 parents, and 122 higher education/administrators). The criterion used to determine whether a practice should be considered to be a validated recommended practice was that more than 50% of the respondents to a particular item indicated strongly agree or agree in response to the statement "This is a recommended practice." All 250 practices included in Form A and Form B of the survey met this criterion. Therefore, all the practices were validated as recommended practices. The validation survey also asked respondents to rate how often the practice is used. These data were analyzed using the criterion that 50% or more of the respondents rated a practice as occurring frequently which resulted in only 13 (5%) out of 250 practices meeting this criterion. The data were then analyzed using the criterion that 50% or more of the respondents rated a practice as occurring sometimes resulting in 227 (91%) practices meeting this criterion. When combined, 240 out of the 250 (96%) practices met this criterion.

All 250 practices met the criteria for validation. A final editing by the investigators for consistency and redundancy of the validated practices resulted in 10 practices being considered redundant with others thus, resulting in a final list of 240 recommended practices in seven strands: Assessment, Child-Focused, Family-Based, Interdisciplinary Models, Technology Applications, Personnel Preparation, and Policies, Procedures and Systems (Sandall, McLean & Smith, 2000).

VII. PROJECT IMPACT: Discussion, Products and Dissemination

The data show which scientific method has been employed to study particular strands and specific practices. These data present the most comprehensive and systematic review of the EI/ECSE research literature to date about which topics and practices have been empirically studied and with which methodologies.

Although this study is the most comprehensive of its kind to date, there are several limitations to the data. First, the criteria for selecting articles to be included in the review was limited to the 48 peer reviewed journals chosen by the management team and the strand chairs.

That is, books, chapters, and conference proceedings were not included in this review. Second, studies selected for coding were based on the judgments of two investigators who read abstracts in the 48 journals over the 9 years. Third, due to resource limitations, the coding of all articles was completed by volunteers. However, inter-coder reliability of at least 85% was established with all coders prior to article coding and inter-coder agreement checks for recommended practices and strand placement were completed for 1/3 of the coded articles.

There are several important implications of the study. First, the EI/ECSE knowledge base is founded on a wealth of research. In less than 10 years, over 1000 peer reviewed articles have been published with over 3/4 of them containing implications for practice. However, most journals in the field are not reporting significant numbers of empirical studies as defined in this project related to children with disabilities birth through five. Only about 25% of the journals reported 20 or more empirical studies related to this population over the 9 years reviewed. Finally, it is evident that the field of EI/ECSE has benefited from the rich array of research methods available to study particular questions.

The analyses of the literature base reveals several possible directions for the field. First, future studies would benefit from clarifying study participants, their disability, the severity of the disability, ethnicity and any other characteristics that may impact on the usefulness and replicability of research findings. Journals might suggest standard classifications such as the IDEA definitions of disability, categories of severity of disability, and categories of study settings. Second, where it may be germane to replicability of results, clarity of family and service provider characteristics should be described. Finally, there are areas of practice that have less empirical research support than others, including interdisciplinary models, technology applications and personnel preparation.

Following are some recommendations for future similar efforts to summarize the research base in EI/ECSE. Given the impetus to be evidence-based, these recommendations may lead to a more efficient method of review and an improved synthesis of the data-base. First, we recommend a review of the literature take place at least every 5 years. This might reduce the number of articles that need to be reviewed and coded. Second, such a review requires adequate resources. The efforts described in this paper are due to the many volunteer coders in the field. It is unlikely that this volunteer resource can be tapped indefinitely! Third, coding forms should include more standardization of terms and few open-ended entry options to improve clarity and consistency and reduce interpretation errors.

This is the first large-scale effort to summarize the literature base in EI/ECSE across all research methods. Such efforts are important to continue so that researchers can improve methods and reporting of settings, variables, and findings; scientific journals can endeavor to encourage more precision in studies and manuscripts; and funders and researchers can be evidence-based in identifying gaps or areas needing further attention in the on-going quest to identify which services and supports are most effective for which children, families, or the personnel who serve them.

Dissemination Activities: Products, Distribution of Products and Regional and National Training

We have engaged in many effective dissemination activities including the production of user-friendly products, widely distributing the products, and providing national and regional training. First, we held focus groups of family members, administrators, practitioners and personnel trainers to learn in which formats they would prefer the recommended practices: text book, program level materials, videos, CD Rom, check lists, etc. All groups suggested check lists, videos program level instruments and the personnel trainers suggested guidelines for training as well as modules. All groups discouraged high tech materials such as CD Rom, and other web based material as not cost effective at this time.

Following these suggestions, we produced **the following list of products (see Appendix D for copies of all products and flyer)**:

- a text book or overview document that describes the project and the DEC Recommended Practices: *DEC Recommended Practices in Early Intervention/Early Childhood Special Education* (Sandall, McLean & Smith, 2000).
- Second, we produced a program self-assessment guide: *DEC Recommended Practices Program Assessment: improving practices for young children with special needs and their families* (Hemmeter, Joseph, Smith & Sandall, 2001).
- Third, we produced a video of the Child Focused practices: *DEC Recommended Practices: Selected Strategies for Teaching Young Children with Special Needs* (DEC, 2001).
- Fourth, we are producing a guide for personnel trainers: Personnel Preparation in Early Childhood Special Education: Implementing the DEC Recommended Practices (Stayton, et. al., in press).
- Fifth, a side-by-side comparison of the DEC Recommended Practices and the NAEYC Developmentally Appropriate Practices is in preparation
- Sixth, check lists for administrators and parents are posted on the DEC web site: www.dec-sped.org
- Six manuscripts have been submitted for publication in peer reviewed journals (see Appendix C for copies of the manuscripts):
    - A review of the literature review and analysis of Form A data
    - An analysis of the single subject literature and Form B data

- An analysis of the group quantitative literature and Form B data
- An analysis of the qualitative literature and Form B data
- An analysis of the field validation study results
- An analysis of the interdisciplinary literature and practices

Distribution of Products

As outlined in our proposal, we sought a commercial publisher in order to ensure that the products would be available to a widespread audience and long after the termination of the project. Sopris West Publishers (Longmont, CO) agreed to publish all products produced on the project. All the products are carried through their catalogue and are marketed by both Sopris West and DEC. DEC has marketed the products through NAEYC and CEC who are carrying them in their catalogues as well reaching well over 150,000 members of those two organizations alone. We have sent free copies of all products to all 619 Coordinators, Part C coordinators, OSEP funded early childhood projects, PACER, AAUAP, NECTAS, the Head Start Bureau and DEC state affiliates. The products as well as free checklists and various forms of the literature that was reviewed are found on the DEC web site: www.dec-sped.org.

Training/Consultant Bank

We also engaged in national and regional training and have developed a DEC Recommended Practices Consultant Bank which is found on www.dec-sped.org. (see Appendix D for graphics of web site, products, trainings and overall activities) The Consultant Bank is composed of individuals the strand chairs nominated who are willing to be contacted by local or state groups or others for assistance in implementing the practices in the strand of their expertise.

We have provided training in the following venues:

National:

- DEC conference: 1999, 2000, 2001
- NAEYC conference: 2000, 2001
- CEC conference: 1999, 2000, 2002
- National Head Start Association conference: 2001
- CEC Teacher Education Division (TED): 2001

Regional:

- New England: June, 2002
- Washington state: May, 2002
- Utah: June, 2002

VIII. GOALS, OBJECTIVES AND ACCOMPLISHMENTS

The following section outlines the projects goals, objectives and the accomplishments related to both.

Objective One: Synthesize the Knowledge Base

Activity 1.1: Identify and classify relevant extant literature: direct services: child services, family services, cultural/linguistic competence, technology applications, learning environments, interdisciplinary services and assessment; indirect services: policy/procedures, personnel development, and systems change (see Appendix A for figure of design).

Accomplishments: 1) Formulated the problem, operational definitions and the criteria with which literature was categorized as relevant and to be included in the review–the operational definition for the synthesis was: *findings that indicate positive changes in development, behavior, learning, functioning, and attitudes attributed to intervention for children from birth through five with disabilities, their families, and the personnel who serve them*. The criteria for the initial inclusion of an article was: *any study in a peer referred journal* *in early intervention or a related field through 1998. 2)* The names of journals to be included were submitted to the Strand Chairs and Management Team to review and recommend additional ones. 3) The journals (48) and studies were selected. 4) Coding sheets were developed for generic features and a separate one for each type of research design: single subject, quantitative (group), qualitative, mixed method, descriptive/survey (see Appendix B). 5) Coders for all design groups were recruited, trained and reliability established.

The literature review consisted of coders completing the coding sheet for all articles which included information about the study (sample, method, results, etc.) as well as the practice(s) recommended by the study. This information was entered into a data base. This data base can be sorted by article, design, practice and by strand.

Outcomes: The ten peer reviewed journals originally proposed for the research literature synthesis was expanded to include an additional 38 peer reviewed journals. The complete list of 48 journals utilized in the literature synthesis appears in Table One. This provided a thorough review of the literature since 1990; a picture of research focus by strand and by practice, e.g. which areas have been more researched than others, etc., and a rich base from which to draw in the product development phase of the project.

Level one screening was completed on all 48 journals resulting in a pool of articles that met the broad conceptual definition proposed in the original grant. This initial pool of articles was duplicated and filed by journal title in a three-ring binder.

Level two screening involved the exclusion of certain studies based on their obvious lack of relevance to the research synthesis. Articles excluded were removed from binders and filed separately. Level two screening resulted in information that made the conceptual and operational definitions of which articles to include more apparent.

Other procedures and results of the literature are reviewed above.

Activity 1.2: **Identify views grounded in experience and values from stakeholders:** scientific experts, families, practitioners, administrators, and personnel trainers/technical assistance providers.

Accomplishments: Experts from the field were selected as Strand Chairs who: 1) assisted in the identification of journals in their area of expertise, 2) held a focus group of other scientific experts at the DEC conference in December of 1998, 3) developed a list of recommended practices from the focus group to be synthesized with that strand of practices from the literature review and other stakeholder groups' recommendations. Focus groups were also conducted at the 1998 DEC conference for three other stakeholder groups: parents, practitioners, and administrators to generate lists of recommended practices from their experiences and values to be synthesized with those of the scientific experts' recommendations and the literature.

Outcomes: 9 strands were selected initially: child services (Dr. Mark Wolery); services to the family (Drs. Carl Dunst & Carol Trivette); interdisciplinary services (Dr. Robin McWilliam); learning environments (Dr. Mary Beth Bruder); cultural/linguistic competence (Drs. Amy Santos & Daphne Thomas); technology (Ms. Kathleen Stremmel); personnel standards (Drs. Vicki Stayton & Pat Miller); policy (Dr. Gloria Harbin); systems change/leadership (Dr. Chris Salisbury); after the focus groups were held, another was recommended and added: assessment (Drs. John Neisworth & Steve Bagnato). All focus groups were conducted and lists of recommended practices submitted from all expert strands and the three other stakeholder groups; all lists were edited for consistency in format (see Appendix E).

Grant personnel funded at LSU Health Sciences Center with the assistance of DEC's Family Consortium Chair, conducted a focus group with family members during the DEC

Annual Meeting in Chicago in December, 1998. Seven family members provided consumer perspectives on preferred and valued early intervention/early childhood special education practices. Personnel from the University of Wisconsin-Milwaukee conducted a focus group of administrators also during the DEC conference. This group of five individuals provided the views on recommended practices as experienced by state and local early childhood administrators. Personnel from the University of Washington conducted the practitioners focus group at the DEC conference. This group of seven made recommendations for practice from the experience and knowledge of the early intervention/early childhood special education practitioner. The focus groups were audio-taped and either a verbatim transcript or detailed notes were generated. A list of recommended practices was derived and sent to focus group participants as a member check on data trustworthiness. The three focus group lists of practices are in Appendix E.

Activity 1.3: **Synthesize (syncretize) the extant literature and subjective views:** (conceptual and integrative review, meta analysis, best evidence, expert opinion).

Accomplishments: The stakeholder and expert focus group practices were synthesized by the Investigators by strand. Each of the three investigators (Smith, McLean and Sandall) synthesized the recommendations of the focus groups in three to four strands, then each Investigator reviewed each of the lists synthesized by the other Investigators. If there was disagreement, the three Investigators discussed the item and reached agreement. These synthesized lists were then be reviewed by the strand chairs for validation. The synthesis of these focus group practices and the literature practices were completed by March, 2000.

Outcomes: A synthesis of expert and stakeholder focus group practices has been completed and has resulted in the products and training outlined above.

Activity 1.4: **Identify *essential* recommended practices** (Q methodology, DEC & NAEYC review, and expert review).

Accomplishments: As noted in the earlier narrative, under the advice of OSEP, the methodology was redesigned to maintain the complete literature review and product development plans. Q studies and DEC and NAEYC review were determined by the Management Team as not essential for the integrity of the project outcomes and were not included in this phase. DEC and NAEYC leaders were included in the national field validation study.

Activity 1.5: **Identify gaps in research base on recommended practices.**

Accomplishments: A data base has been established of the extant literature. This data base can be sorted by strand and by practices. Several analyses of the data base has been conducted and five related manuscripts have been written and submitted to peer reviewed journals for publication (see above and Appendix C for manuscripts). These manuscripts outline areas for further study.

Outcomes: see Appendix C for the analyses of the data base and recommendations for future efforts.

Objective Two: Determine Product Uses and Effective Formats

Activity 2.1: **Create a list of recommended practices.**

Accomplishments: As noted above, lists of recommended practices were generated from the extant literature and four focus groups. These lists were synthesized and field validated resulting in the DEC Recommended Practices in Early Intervention/Early Childhood Special Education.

Outcomes: As noted above, several published books, guides and videos have been produced, as well as web site materials including checklists for administrators, parents, and a consultant bank. Training has taken place at 10 national conferences and for three regional conferences.

Activity 2.2: **Conduct a field validation of the list of recommended practices (internal DEC constituent validation; external constituent validation).**

Accomplishments: The final list of recommended practices were validated by a national survey as outlined above.

Activity 2.3: **Conduct focus groups of stakeholders on preferred formats. (families, practitioners/administrators, personnel trainers/T.A. providers).**

Accomplishments: Focus groups have been conducted with parents, administrators, practitioners and personnel trainers. Each focus group consisted of approximately 10 participants and asked the same questions. The questions to the groups included: use of current DEC recommended practices books and preferred formats for particular uses.

Outcomes: The focus group recommendations for formats have been compiled and reviewed by the members of the groups. These format recommendations were summarized and guided the product development activities.

Activity 2.4: **Develop recommended practices formats.**

Accomplishments: Products were developed that met the format suggestions from the focus groups and available resources (see above for product descriptions).

Outcomes: As noted above, a text book, a program assessment guide, a personnel development guide and a video were produces and will be carried by a commercial publisher. Check lists, literature review materials and a consultant bank are on the DEC web site: www.dec-sped.org

Finally, six manuscripts have been submitted for publication in peer reviewed journals.

Activity 2.5: Finalize first drafts of product formats.

Accomplishments: All products have been drafted and produced except for the personnel development guide which is in production.

Activity 2.6: Field test product formats via case studies.

Accomplishments: The only product that received a field test was the program assessment guide because of time limitations.

Activity 2.7: Revise product formats.

Accomplishments: The program assessment guide was revised based on a field test.

Activity 2.8: Disseminate products and information about project findings

Accomplishments: Results and project information have been disseminated at national and regional conferences; through six manuscripts submitted to peer reviewed journals, through newsletters and brochures and through our national dissemination partners: PACER, AAUAP, NECTAS, NAEYC, NHSA, and the Head Start Bureau; and through national mailings of product flyers and in some cases of all the products (Part C Coordinators, 619 Coordinators and EC Project Directors). See above for review of dissemination activities.

Objective 3: Link the knowledge base on recommended practices to service delivery.

Activity 3.1: Develop hi-tech instructional materials (video, CD ROM).

Accomplishments: based on the suggestions from stakeholder groups, we did not develop CD ROM but we did develop a video and web based products.

Outcomes: one video was produced on child focused practices and is published by Sopris West.

Activity 3.2: Provide educational sessions using a variety of instructional formats.

Accomplishments: see above for description of conference sessions

Activity 3.3: Publish and disseminate final recommended practices in multiple product formats. See above

Activity 3.4: Build systems change capacity.

Accomplishments: we worked with national dissemination partners to ensure widespread knowledge of the recommended practices, we conducted national trainings and regional workshops, we distributed hundreds of free copies of all products nation-wide, and we submitted a grant proposal to OSEP for a model demonstration project to study systems change and adoption of the recommended practices.

Outcomes: over 200,000 people have either received free copies of the products or have received information about the practices and the products. We have received an OSEP grant to study the adoption of the recommended practices and systems change strategies in two local programs—the Bridging the Gap project, which is in its second year. This project is providing not only the opportunity to study the adoption of the practices, but also the opportunity to continue the dissemination activities related to the recommended practices including products and training.

ORIGINAL PROJECT TIMELINES

	Proposed Years/Quarters									
Activities	**1**				**2**				**3**	
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**
OBJECTIVE 1: Synthesize the knowledge base										
Activity 1.1: Identify and classify relevant extant literature: ***direct services:*** **child services, family services, cultural/linguistic competence, technology applications, learning environments, and interdisciplinary services;** ***indirect services*****: policy/procedures, personnel development, and systems change.**	X	X								
Activity 1.2: Identify views grounded in experience and values from stakeholders: families, practitioners, administrators and personnel trainers/T.A. providers.	X	X								
Activity 1.3: Synthesize (syncretize) the extant literature and subjective views (conceptual and integrative review, meta analysis, best evidence, expert opinion).		X	X	X						
Activity 1.4: Identify ***essential*** **recommended practices (Q methodology, DEC & NAEYC review, and expert review.**				X						

Activity 1.5: Identify gaps in research base on recommended practices.			X	X						

OBJECTIVE 2: Determine product uses and effective formats										
Activity 2.1: Create a list of recommended practices.				X	X					
Activity 2.2: Conduct a field validation of the list of recommended practices (internal DEC constituent validation; external constituent validation).					X					
Activity 2.3: Conduct focus groups of stakeholders on preferred formats. (families, practitioners/administrators, personnel trainers/T.A. providers).			X	X						
Activity 2.4: Develop recommended practices formats.						X				
Activity 2.5: Finalize first drafts of product formats.						X				
Activity 2.6: Field test product formats via case studies.						X	X			
Activity 2.7: Revise product formats.							X	X		
Activity 2.8: Disseminate products and information about the project findings.			X	X	X	X	X	X	X	X

OBJECTIVE 3: Link the knowledge base on recommended practices to service delivery.										

Activity 3.1: Develop hi-tech instructional materials (video, CD ROM).									X	X
Activity 3.2: Provide educational sessions using a variety of instructional formats.								X	X	X
Activity 3.3: Publish and disseminate final recommended practices in multiple product formats.								X	X	X
Activity 3.4: Build systems change capacity.								X	X	X

Table 1

Number of Articles in Each Peer-Reviewed Journal Included in DEC Research Synthesis

Journal	Number of Articles
American Journal of Occupational Therapy	*32*
American Journal on Mental Retardation	*50*
Archives of Physical Medicine and Rehabilitation	2
Augmentative and Alternative Communication	15
Behavior Modification	11
Behavior Therapy	4
Behavioral Disorders	1
Child Development	6
Child: Care, Health and Development	13
Developmental Medicine and Child Neurology	*40*
Developmental Psychology	5
Diagnostique	6
Early Childhood Research Quarterly	11
Early Education and Development	*21*
Education and Training in Mental Retardation and Developmental Disabilities	18
Education and Treatment of Children	16

Exceptional Children	*47*
Exceptionality	3
Family Relations	13
Infants and Young Children	12
Infant-Toddler Intervention	*45*
Journal of Abnormal Child Psychology	8
Journal of Applied Behavior Analysis	*55*
Journal of Applied Developmental Psychology	13
Journal of Behavioral Education	11
Journal of Communication Disorders	1
Journal of Early Intervention	*102*
Journal of Emotional and Behavioral Disorders	7
Journal of Marriage and Family	0
Journal of Pediatric Nursing	13
Journal of Pediatric Psychology	7
Journal of Special Education	5
Journal of Special Education Technology	0
Journal of Speech, Language, and Hearing Research	*26*
Journal of The Association for Persons with Severe Handicaps	*32*
Journal of Visual Impairment & Blindness	18
Language, Speech and Hearing Services in Schools	18
Mental Retardation	*22*

Merrill-Palmer Quarterly	0
Neonatal Network	9
Occupational Therapy Journal of Research	6
Pediatric Physical Therapy	9
Pediatrics	7
Physical & Occupational Therapy in Pediatrics	12
Physical Therapy	2
Teacher Education and Special Education	1
Topics in Early Childhood Special Education	*73*
Volta Review	7

Note: Journals in *italics* designate those that contributed 20 or more articles to the review.

Table 2

Number and Percent of Articles Interpreted By Coders as Having at Least One Recommended Practice by Method

Method	N (%)
Group Quantitative	450 (54%)
Single Subject	184 (22%)
Descriptive / Survey	121 (15%)
Qualitative	74 (9%)
Mixed Method *	6 (1%)
Total	835 (100%)

* Mixed method = some combination of group quantitative, qualitative, descriptive / survey and single subject methods

Table 3

Number and Percent of Articles by Research Method Employed and Recommended Practices Strand Placement

Method	Strand						
	Child-Focused	Family-Based	Polices Procedures, and Systems Change	Assessment	Personnel Preparation	Technology Applications	Interdisciplinary Models
Group Quantitative	187 (47%)	145 (65%)	50 (47%)	77 (74%)	27 (33%)	13 (41%)	18 (60%)
Single Subject	158 (40%)	21 (9%)	2 (2%)	20 (19%)	9 (11%)	6 (19%)	2 (7%)
Descriptive / Survey	38 (10%)	30 (13%)	30 (28%)	7 (7%)	23(28%)	11 (34%)	3 (10%)
Qualitative	12 (3%)	24 (11%)	22 (21%)	0 (0%)	22 (27%)	2 (6%)	7 (23%)
Mixed Method *	4 (1%)	3 (1%)	2 (2%)	0 (0%)	2 (2%)	0 (0%)	0 (0%)
Total **	399	223	106	104	83	32	30

* Mixed method = some combination of group quantitative, qualitative, descriptive/survey and single subject methods

** Articles could support more than one strand, thus total exceeds number of articles reviewed (835)

Table 4

Number of Articles by Method and Publication Year

Method	Year								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
Group Quantitative	41	43	40	60	62	51	53	67	33
	54.7%	51.8%	48.8%	53.1%	55.9%	52.6%	55.2%	66.3%	42.9%
Single Subject	14	13	23	33	27	21	20	13	20
	18.7%	15.7%	28.1%	29.2%	24.3%	21.7%	20.8%	12.9%	26.0%
Descriptive / Survey	14	22	14	16	15	13	10	6	11
	18.7%	26.5%	17.1%	14.2%	13.5%	13.4%	10.4%	5.9%	14.3%
Qualitative	6	5	4	4	7	9	13	14	12
	8.0%	6.0%	4.9%	3.5%	6.3%	9.3%	13.5%	13.9%	15.6%
Mixed Methods *	0	0	1	0	0	3	0	1	1
			1.2%			3.1%		1.0%	1.3%
Total	75	83	82	113	111	97	96	101	77

* Mixed method = some combination of group quantitative, qualitative, descriptive/survey and single subject methods

Table 5

Number and Percent of Articles Reporting Disability Categories of Child Study Participants by Year

Disability Category	Year								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
Autism	6	15	10	8	15	9	8	13	15
	5.1%	12.8%	7.7%	4.9%	8.9%	6.1%	5.6%	7.3%	15.3%
Cerebral Palsy	14	8	13	16	13	16	12	16	6
	11.9%	6.8%	10.0%	9.9%	7.7%	10.9%	8.4%	9.0%	6.1%
Developmental Delay	15	15	20	36	23	27	24	31	22
	12.7%	12.8%	15.4%	22.2%	13.7%	18.4%	16.8%	17.4%	22.4%
Developmental Disability	5	7	9	10	9	8	10	11	8
	4.2%	6.0%	6.9%	6.2%	5.4%	5.4%	7.0%	6.2%	8.2%
Down Syndrome	9	13	14	15	21	20	16	16	7
	7.6%	11.1%	10.8%	9.3%	12.5%	13.6%	11.2%	9.0%	7.1%
Emotional/ Behavioral Disorder	4	5	5	6	9	2	5	10	4
	3.4%	4.3%	3.8%	3.7%	5.4%	1.4%	3.5%	5.6%	4.1%
Hearing Impairment/ Deaf	5	2	6	11	8	7	10	14	5
	4.2%	1.7%	4.6%	6.8%	4.8%	4.8%	7.0%	7.9%	5.1%

Mental Retardation	18 15.3%	15 12.8%	14 10.8%	15 9.3%	16 9.5%	13 8.8%	16 11.2%	17 9.6%	8 8.2%
Speech/ Language Impairment	9 7.6%	3 2.6%	10 7.7%	11 6.8%	16 9.5%	11 7.5%	12 8.4%	14 7.9%	4 4.1%
Visual Impairment/ Blindness	5 4.2%	9 7.7%	7 5.4%	6 3.7%	6 3.6%	5 3.4%	5 3.5%	10 5.6%	4 4.1%
Other	28 23.7%	24 20.5%	22 16.9%	27 16.7%	32 19.0%	29 19.7%	25 17.5%	26 14.6%	15 15.3%

Table 6

Number and Percent of Articles Reporting Severity of Disability by Year

	Year								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
Articles Reporting Severity	55	51	48	71	66	51	61	54	42
	73%	61%	59%	63%	59%	53%	64%	53%	55%

Table 7

Number and Percent of Articles Reporting Study Setting Data

Study Setting	Number / Percent of Articles
Home	225 23.4%
Hospital/Clinic	230 23.9%
Inclusive/Integrated Classroom	170 17.7%
Separate or Segregated Classroom	130 13.5%
Experimental Settings/Separate from peers	33 3.4%
Other – Survey/Interview	152 15.8%
Other – Not clear	23 2.4%
Totals	963

Table 8

Number and Percent of Articles Reporting Family Income and Education Levels by Year

	Year								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
Articles Reporting Family Income Level	16 21%	16 19%	19 23%	29 26%	22 20%	19 20%	23 24%	22 22%	18 23%
Articles Reporting Family Education Level	20 27%	18 22%	22 27%	29 26%	22 20%	25 26%	34 35%	34 33%	26 34%

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Appendix A

Figures

DEC RECOMMENDED PRACTICES
STRAND CHAIRS

Direct Services (b-5)

- Child Services - Dr. Mark Wolery
- Family Services - Drs. Carl Dunst and Carol Trivette
- Cultural & Linguistic Competence - Drs. Amy Santos and Daphne Thomas
- Technological Applications - Ms. Kathleen Stremel
- Learning Environments - Dr. Mary Beth Bruder
- Interdisciplinary Models - Dr. Robin McWilliam
- Assessment - Drs. John Neisworth and Steve Bagnato

Indirect Services/Supports

- Policy & Procedures - Dr. Gloria Harbin
- Personnel Development - Drs. Vicki Stayton and Pat Miller
- Systems Change, Maintenance & Leadership Climate - Dr. Chris Salisbury

Strand Liaison/Coordinator

- Dr. Sam Odom

DEC RECOMMENDED PRACTICES PROJECT:

Ten Subcategories of Professional Practices by Two Early Childhood Age Groups

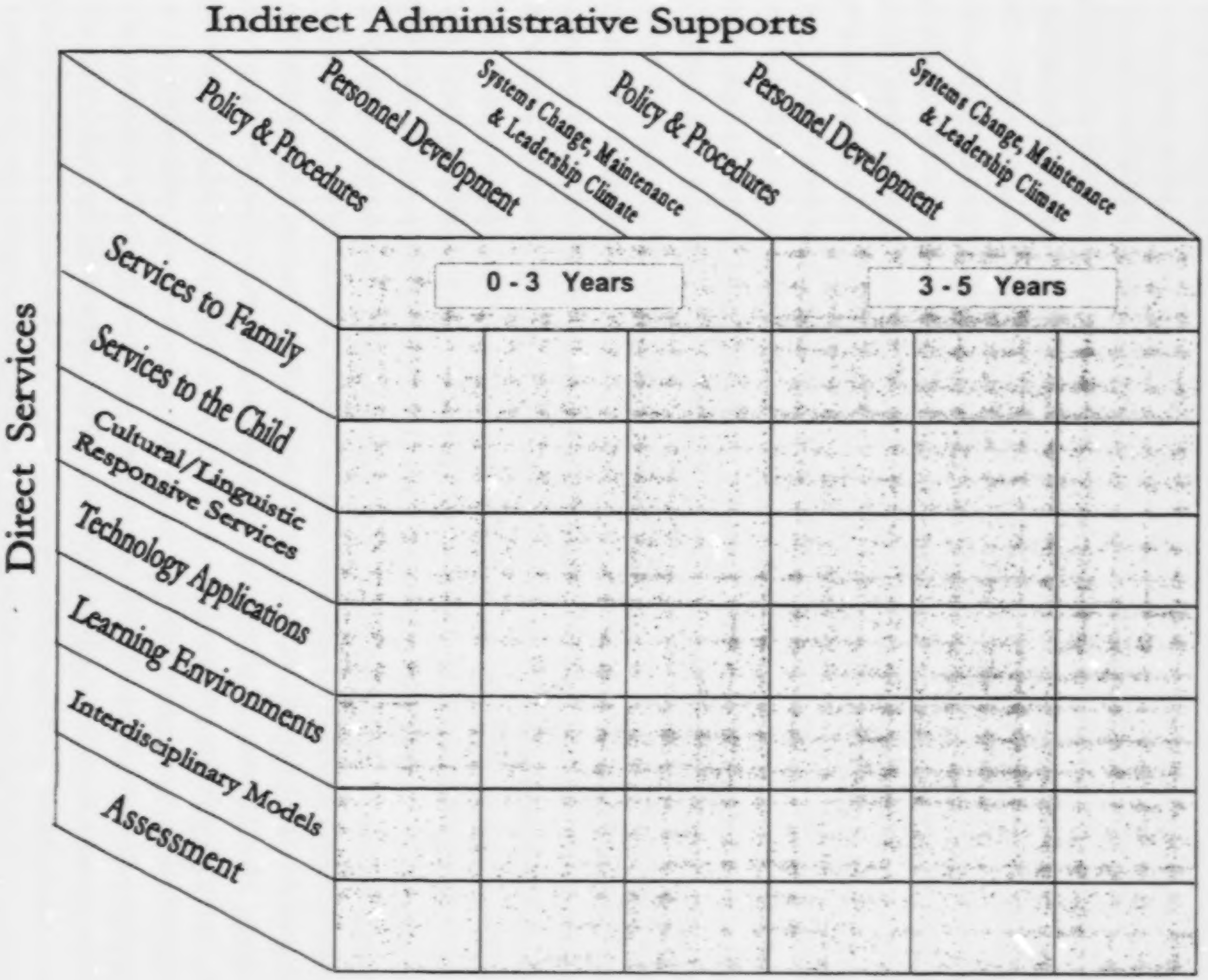

Indirect Administrative Supports
Policy & Procedures
Personnel Development
Systems Change, Maintenance & Leadership Climate
Policy & Procedures
Personnel Development
Systems Change, Maintenance & Leadership Climate
0 - 3 Years
3 - 5 Years
Direct Services
Services to Family
Services to the Child
Cultural/Linguistic Responsive Services
Technology Applications
Learning Environments
Interdisciplinary Models
Assessment

Figure 1. Project Design

Phase 1: Synthesizing the Knowledge Base

1. **The knowledge base on high quality services for young children, their families, and the personnel who serve them is composed of both objective, empirical indicators in the extant literature and subjective views grounded in personal experiences and values.**
2. **There are multiple perspectives on what constitutes high quality services for young children, their families, and personnel.**

- ❖ Identification and classification of relevant extant literature: direct services (child focused; family focused; cultural/linguistic competency; technology applications; learning environments; and interdisciplinary models) & indirect services (policy/procedures; personnel development; and systems change, maintenance, and leadership climate)
- ❖ Identification of views grounded in experience and values (practitioners; families; administrators; personnel trainers)
- ❖ Syncretism of extant literature and subjective views to define knowledge base
- ❖ Identification of *essential* recommended practices and validation of practices (Q methodology studies; NAEYC expert review; and DEC expert group review)
- ❖ Identification of how recommended practices would be used and identification of product formats that are user friendly
- ❖ Dissemination of information

Figure 1. Project Design (continued)

Phase 2: Determining Product Uses and Formats

3. **Linking the knowledge base of recommended practices requires that information and guidance be provided in multiple formats for multiple purposes.**
   - Field validation of recommended practices (internal DEC constituent validation; and external DEC constituent validation)
   - Finalize first draft of recommended practices
   - Identify gaps in research synthesis of recommended practices
   - Develop recommended practice product formats
   - Finalize first draft of products formats
   - Field test product formats via case studies
   - Revise product formats
   - Dissemination of information

Figure 1. Project Design (continued)

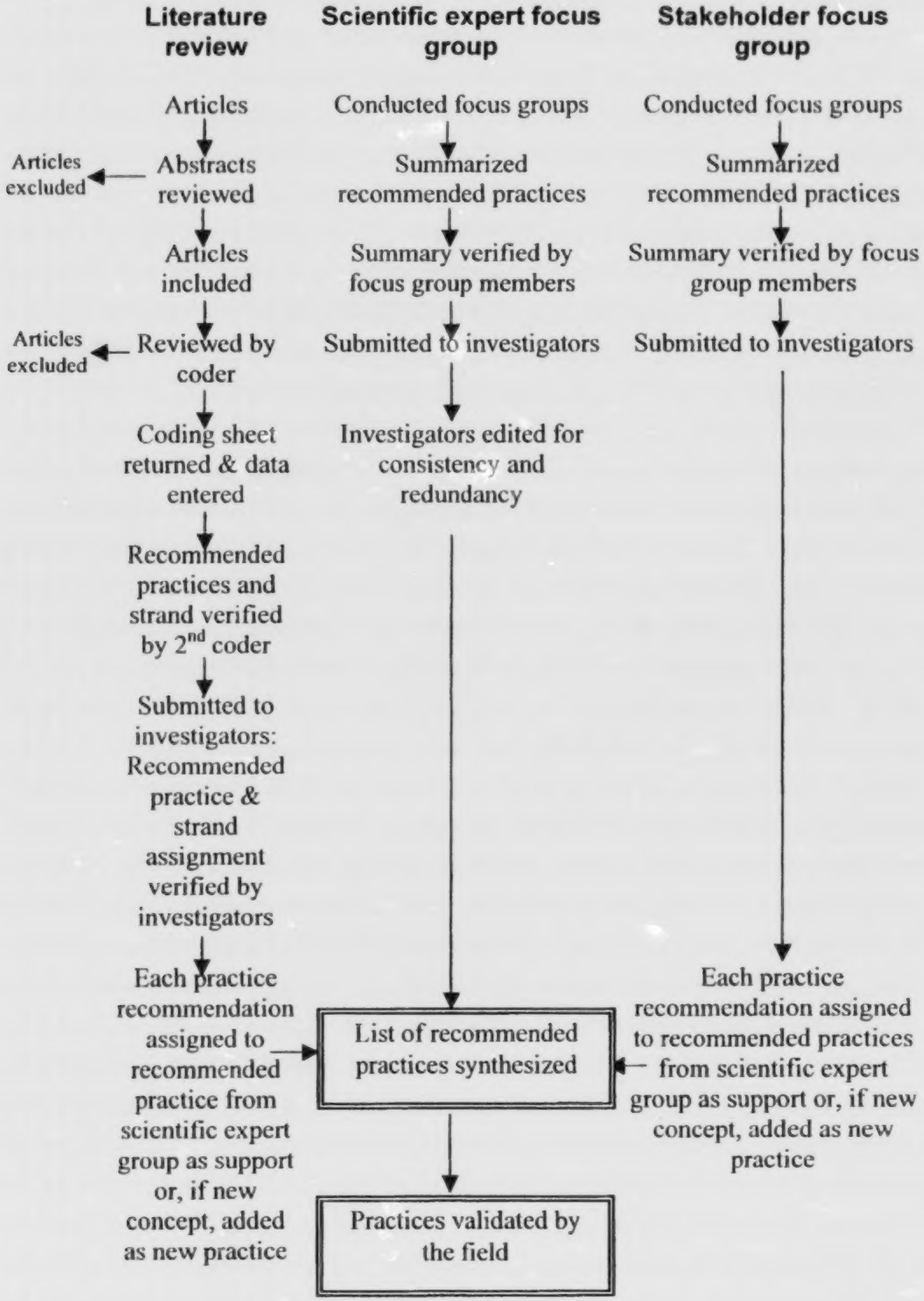
Phase 3: Linking Recommended Practices to Service Delivery

4. **Meaningful and sustainable change resulting in implementing recommended practices requires information and support**

- Develop high tech instructional materials
- Develop systems change and administrative materials
- Provide educational sessions using a variety of instructional formats
- Publish and disseminate final recommended practices in multiple product formats

Note: Items 1 – 4 represent research hypotheses that guide each of the three phases of the research design

Figure 1. Data collection, analysis, and synthesis of recommendations from data sources


Literature review
Scientific expert focus group
Stakeholder focus group
Articles
Abstracts reviewed
Articles excluded
Articles included
Reviewed by coder
Articles excluded
Coding sheet returned & data entered
Recommended practices and strand verified by 2nd coder
Submitted to investigators: Recommended practice & strand assignment verified by investigators
Each practice recommendation assigned to recommended practice from scientific expert group as support or, if new concept, added as new practice
Conducted focus groups
Summarized recommended practices
Summary verified by focus group members
Submitted to investigators
Investigators edited for consistency and redundancy
Conducted focus groups
Summarized recommended practices
Summary verified by focus group members
Submitted to investigators
Each practice recommendation assigned to recommended practices from scientific expert group as support or, if new concept, added as new practice
List of recommended practices synthesized
Practices validated by the field

Appendix B

Literature Review Coding Forms

Name of Coder ______________________

Date Sent ____________
Date Received ____________
(Rev. 5/31/99)

PART A: GENERIC CODING SHEET

1. Study ID Number ________

2. Year of Publication ________

3. Source ________

SAMPLE INFORMATION

4. Study participants (check only one)
   - ☐ 01. Children with disabilities - Total number ____
   - ☐ 02. Children without disabilities - Total number ____
   - ☐ 03. Families of children with disabilities - Total number ____
   - ☐ 04. Families of children without disabilities - Total number ____
   - ☐ 05. Personnel - Total Number ____
     Please specify roles and numbers of each ______________________________
   - ☐ 06. Combination of the above (please specify type of participant and numbers of each)

5. Gender of Participants
   - ☐ 01. Male; N = ____ % = ____
   - ☐ 02. Female; N = ____ % = ____
   - ☐ 03. Not specified

6. Study participants chronological age range(s) ______________________________

7. Mean age(s) of study participants ______________________________

8. Standard deviation(s) of study participant(s▯) ages if reported ______________________________

9. Race of Participants (check all that apply)
   - ☐ 01. African-American; N = ____ % = ____
   - ☐ 02. Asian-American; N = ____ % = ____
   - ☐ 03. Latino-American; N = ____ % = ____
   - ☐ 04. White; N = ____ % = ____
   - ☐ 05. Native American; N = ____ % = ____
   - ☐ 06. Other (please specify race and number or percentage) ______________________________
   - ☐ 07. Not specified

Name of Coder ____________________

10. Disability of Participants (check all that apply)
☐ 01 Cerebral Palsy; N = ___ % = ___
☐ 02. Down Syndrome; N = ___ % = ___
☐ 03. Mental Retardation; N = ___ % = ___
☐ 04. Developmental Disability; N = ___ % = ___
☐ 05. Autism; N = ___ % = ___
☐ 06. Visual impairment/blindness; N = ___ % = ___
☐ 07. Hearing impairment/deaf; N = ___ % = ___
☐ 08. Speech/Language impairment; N = ___ % = ___
☐ 09. Emotional/Behavioral Disorder; N = ___ % = ___
☐ 10. Developmental Delay; N = ___ % = ___
☐ 11. Other (please specify); N = ___ % = ___

11. Is the severity of disabilities or developmental levels for children discussed?
☐ 01. Yes
☐ 02. No

12. If yes, what levels are identified? For example: mild to severe; mental age; developmental quotient? ________
____
____
____

13. Is the educational level of any family member reported?
☐ 01. Yes
☐ 02. No

If yes, list reported descriptive statistics. For example: mean, ranges, categories, etc.
____
____
____
____

14. Are any family income levels reported?
☐ 01. Yes
☐ 02. No

15. If yes, list reported descriptive statistics, for example, mean, ranges, categories, etc.
____
____
____
____

16. Study Setting: (check all that apply)
☐ 01. Home
☐ 02. Segregated classroom
☐ 03. Inclusive or integrated classroom
☐ 04. Hospital/clinic
☐ 05. Other (please specify) ____________________
____
____

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Name of Coder ______________________________ (Rev. 5/31/99)

PART B: SPECIALIZED CODING SHEET FOR QUALITATIVE STUDIES

1. Includes a description of the conceptual framework.
   ☐ 01. Yes
   ☐ 02. No

2. What is the general focus of the study? ____
____
____

3. Number of study participants. _____

4. Type of study.
   ☐ 01. Ethnographic
   ☐ 02. Naturalistic
   ☐ 03. Interpretive
   ☐ 04. Case study
   ☐ 05. Participant observation
   ☐ 06. Phenomenological
   ☐ 07. Historical
   ☐ 08. Other (please specify) ________________________

5. Includes a description of the procedures.
   ☐ 01. Participant selection
   ☐ 02. Data collection methods

6. Data source(s). (Check all that apply)
   ☐ 01. Observation
   ☐ 02. Interviews
   ☐ 03. Documents
   ☐ 04. Combination of data sources (please describe) __________________
   ☐ 05. Other (please specify) ________________________________

7. What was the length of the data collection period? ____________

8. Includes description of data analysis. (Check all that apply)
   ☐ 01. Detailed
   ☐ 02. Appropriate
   ☐ 03. Inductive

9. Evidence of credibility. (Check all that apply)
   ☐ 01. Multiple methods
   ☐ 02. Member checks
   ☐ 03. Audit trail
   ☐ 04. Triangulation across methods
   ☐ 05. Triangulation across sources
   ☐ 06. Intercoder reliability checks
   ☐ 07. Other (please specify) ____

Name of Coder ____________________

____

____

10. Includes a discussion of the meaning of the findings in terms of theory.
- ☐ 01. Yes
- ☐ 02. No

RECOMMENDED PRACTICES

Please write all recommended practice(s) supported in the study. Practices may be supported by the data even if the authors□ conclusions do not explicitly acknowledge them. Practices may be related to contextual variables in addition to, or instead of, the variable(s) examined in the study. Recommended practices are written in the present tense, using active voice, with people as the subject of the sentence. Examples of specified practices gleaned from qualitative literature for use as models follow.

Exemplars

1) Program staff including therapists should explain to families the advantages and disadvantages of different therapy delivery models (e.g., home versus clinic-based).

2) Program staff including therapists should explain to families the pros and cons related to frequency of the delivery of therapy services. (e.g., once per week, once per month, not at all).

3) Professionals should use skills that facilitate the communication process, such as listening skills, openness to suggestions, responsivity and a willingness to disclose information to promote collaboration with families.

11. Recommended Practice #1. ____

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____

____

12. Check the most appropriate strand placement for the above identified recommended practice.

Recommended Practice #1

- ☐ 01. Child-focused
- ☐ 02. Family-centered
- ☐ 03. Cultural/linguistic competency

Name of Coder ______________________________

- ☐ 04. Technology application
- ☐ 05. Learning environments
- ☐ 06. Interdisciplinary models
- ☐ 07. Policy and procedure
- ☐ 08. Personnel development
- ☐ 09. Systems change, maintenance and leadership climate
- ☐ 10. Assessment
- ☐ 11. Other (please specify) ______________________________

13. Recommended Practice #2. ______________________________

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____

14. Check the most appropriate strand placement for the above identified recommended practice.

Recommended Practice #2

- ☐ 01. Child-focused
- ☐ 02. Family-centered
- ☐ 03. Cultural/linguistic competency
- ☐ 04. Technology application
- ☐ 05. Learning environments
- ☐ 06. Interdisciplinary models
- ☐ 07. Policy and procedure
- ☐ 08. Personnel development
- ☐ 09. Systems change, maintenance and leadership climate
- ☐ 10. Assessment
- ☐ 11. Other (please specify) ______________________________

15. Recommended Practice #3. ______________________________

____

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16. Check the most appropriate strand placement for the above identified recommended practice.

Name of Coder ______________________________

Recommended Practice #3

- ☐ 01. Child-focused
- ☐ 02. Family-centered
- ☐ 03. Cultural/linguistic competency
- ☐ 04. Technology application
- ☐ 05. Learning environments
- ☐ 06. Interdisciplinary models
- ☐ 07. Policy and procedure
- ☐ 08. Personnel development
- ☐ 09. Systems change, maintenance and leadership climate
- ☐ 10. Assessment
- ☐ 11. Other (please specify) ______________________________

17. Recommended Practice #4. ____
____
____
____
____
____
____

18. Check the most appropriate strand placement for the above identified recommended practice.

Recommended Practice #4

- ☐ 01. Child-focused
- ☐ 02. Family-centered
- ☐ 03. Cultural/linguistic competency
- ☐ 04. Technology application
- ☐ 05. Learning environments
- ☐ 06. Interdisciplinary models
- ☐ 07. Policy and procedure
- ☐ 08. Personnel development
- ☐ 09. Systems change, maintenance and leadership climate
- ☐ 10. Assessment
- ☐ 11. Other (please specify) ______________________________

If you have identified additional empirically validated practices, write them and the most appropriate strand placement on the back of this page or on a continuation page.

Name of Coder ______________________ (Rev. 7/12/99)

PART B: SPECIALIZED CODING SHEET FOR GROUP DESIGN QUANTITATIVE STUDIES

A. Sampling - Sampling refers to processes associated with participant selection and assignment to groups

1. Were participants randomly selected from a defined population? ☐ 01. Yes ☐ 02. No

2. Were participants randomly assigned to groups? ☐ 01. Yes ☐ 02. No

3. Were participants matched on any attribute variables? ☐ 01. Yes ☐ 02. No

4. If yes, list (e.g., developmental age) ______________________

5. Was a control group (i.e., group that received **no** treatment) used? ☐ 01. Yes ☐ 02. No

6. Was a covariate(s) used? ☐ 01. Yes ☐ 02. No

7. If yes, please list the covariate(s). ______________________

B. Independent Variable(s) and Associated Categories - Independent variables encompass variables actively manipulated by the researcher (i.e., experimental variables) and attribute variables (i.e., assigning participants to groups based on an attribute such as "severity of disability"), which are examined as part of substantive hypothesis(es)

List, or briefly describe, the independent variable(s) **and** the categories associated with the variable(s):

IV #1: ______________________

Categories associated with IV #1: ______________________

IV #2 (if applicable): ______________________

Categories associated with IV #2: ______________________

Name of Coder ____________________

IV #3 (if applicable): ____

Categories associated with IV #3: ______________________________________

(if applicable, list other IVs and associated categories on back of page)

If the study is pre-experimental (i.e., everyone receives the same treatment or is assigned to a single category of treatment) or causal comparative (i.e, "independent variable" being examined is an attribute or ability variable that cannot be manipulated by the researcher), briefly describe the "treatment" experienced by all participants: ______________________________________

C. Fidelity of Treatment

8. Did the author(s) provide information related to fidelity of treatment implementation?
☐ 01. Yes ☐ 02. No

9. If yes, briefly describe. ______________________________________

D. Duration of Study

10a. Information provided about length of intervention or treatment received? ☐ 01. Yes ☐ No.

10b. If yes, check all that apply.
☐ 01. Length in hours/minutes ____
☐ 02. Length in days ____
☐ 03. Length in months ____
☐ 04. Frequency of sessions ____
Length of sessions (e.g., minutes, hours, if specified) ____
☐ 05. Other duration data ____

E. Dependent Variable(s) and Dependent Measure(s)

List, or briefly describe, the dependent variable(s) **and** the dependent measures used to define the variable(s):

DV #1: ______________________________________

Name of Coder ______________________

Dependent Measure #1: ______________________

DV #2 (if applicable): ______________________

Dependent Measure #2 (if applicable): ______________________

DV #3 (if applicable): ______________________

Dependent Measure #3 (if applicable): ______________________

(if applicable, list other DVs and associated dependent measures on back of page)

11. Was information provided about reliability/agreement of study measures?
☐ 01. Yes ☐ 02. No

12. If yes, what type(s) of reliability/agreement data were provided? (check all that apply)
☐ 01. Test-retest
☐ 02. Internal consistency (e.g., Cronbach's alpha)
☐ 03. Parallel forms
☐ 04. Interrater reliability
☐ 05. Standard error of measurement
☐ 06. Interobserver agreement

13. Were reported reliability coefficients based on data obtained from the study sample?
☐ 01. Yes ☐ 02. No ☐ 03. Not Applicable

14. Was information provided about the validity of study measures? ☐ 01. Yes ☐ 02. No

Name of Coder ____________________

15. If yes, what type(s) of validity data were provided? (check all that apply)
   - ☐ 01. Face/content
   - ☐ 02. Predictive validity
   - ☐ 03. Concurrent validity
   - ☐ 04. Construct (e.g., factor analytic evidence)
   - ☐ 05. Other (specify) ________________

16. Were reported validity coefficients based on data obtained from the study sample?
   ☐ 01. Yes ☐ 02. No ☐ 03. Not Applicable

17. For dependent measures involving observational data collection, were measures of interobserver agreement or reliability calculated? ☐ 01. Yes ☐ 02. No
   ☐ 03. Not Applicable

18. If yes, what type(s) of agreement or reliability index was provided? (check all that apply)
   - ☐ 01. Simple agreement
   - ☐ 02. Kappa
   - ☐ 03. Weighted kappa
   - ☐ 04. Intraclass correlation coefficient (ICC)
   - ☐ 05. Other (specify) ____

F. Major Study Hypothesis(es)

List the major substantive hypothesis(es) evaluated by the author(s):

Hypothesis #1 ____
____
____
____
____

Hypothesis #2 (if applicable): ____
____
____
____
____

Hypothesis #3 (if applicable): ____
____
____
____
____
____
____

Name of Coder ____________________

Hypothesis #4 (if applicable): ____

____

____

____

____

____

(if applicable, list other hypotheses on the back of page)

G. Statistical Analyses

19. Which of the following types of inferential statistics were used to test the hypotheses listed above? (check all that apply)

☐ 01. Univariate parametric statistics (e.g., t-tests, ANOVA, multiple regression, Pearson r)
☐ 02. Univariate nonparametric statistics (e.g., Spearman rho, Mann Whitney U Test, chi square contingency table, Friedman 2-Way ANOVA, Wilcoxon matched pairs sign rank test)
☐ 03. Multivariate parametric statistics (e.g., MANOVA, discriminant analysis, canonical correlation analysis)
☐ 04. Multivariate nonparametric statistics (e.g., logistic regression)
☐ 05. Other (e.g., Structural Equation Modeling [SEM], Confirmatory Factor Analysis, Hierarchical Linear Models [HLM)]), please specify ____________________

H. Effect Size(s) for Major Study Hypothesis(es) and Empirically Validated Practice(s):

20. For major study hypothesis #1 is an effect size measure reported?
☐ 01. Yes ☐ 02. No

21. If yes, check type of measure reported and list value.

☐ 01. eta squared ($\square^2$) = __________
☐ 02. omega squared ($\square^2$) = __________
☐ 03. multivariate lambda (□, e.g., Wilks' lambda) = __________
☐ 04. bivariate correlation (r or r^2) = __________
☐ 05. coefficient of determination (R or R^2) = ________
☐ 06. Adjusted R^2 (Wherry) = ________
☐ 07. Cohen's d (d) = ____________
☐ 08. Cohen's k (k) = ____________
☐ 09. Glass' delta (Δ) = ____________
☐ 10. Phi squared ($\square^2$) = __________
☐ 11. other (please specify) ______________________
☐ 12. effect size reported, but type of measure not specified = ____________

22. If the analysis for major study hypothesis #1 was factorial (e.g., 2-Way ANOVA), were any interactions statistically significant? ☐ 01. Yes ☐ 02. No

Name of Coder ____________________

23. If yes, briefly describe the nature of the interactions (e.g., the treatment was more effective for children with more significant disabilities) ____________________

24. For major study hypothesis #2 is an effect size measure reported?
☐ 01. Yes ☐ 02. No

25. If yes, check type of measure reported and list value.

☐ 01. eta squared $(\square^2)$ = __________
☐ 02. omega squared $(\square^2)$ = __________
☐ 03. multivariate lambda (□, e.g., Wilks' lambda) = __________
☐ 04. bivariate correlation (r or r^2) = __________
☐ 05. coefficient of determination (R or R^2) = __________
☐ 06. Adjusted R^2 (Wherry) = __________
☐ 07. Cohen's d (d) = __________
☐ 08. Cohen's k (k) = __________
☐ 09. Glass' delta (Δ) = __________
☐ 10. Phi squared $(\square^2)$ = __________
☐ 11. other (please specify) __________
☐ 12. effect size reported, but type of measure not specified = __________

26. If the analysis for major study hypothesis #2 was factorial (e.g., 2-Way ANOVA), were any interaction effects involving the empirically validated practice statistically significant?
01. Yes ☐ 02. No

27. If yes, briefly describe the nature of the interaction (e.g., the treatment was more effective for children with more significant disabilities) ____________________

28. For major study hypothesis #3 is an effect size measure reported?
☐ 01. Yes ☐ 02. No

Name of Coder ______________________

29. If yes, check type of measure reported and list value.

☐ 01. eta squared ($\square^2$) = __________
☐ 02. omega squared ($\square^2$) = __________
☐ 03. multivariate lambda (□, e.g., Wilks' lambda) = __________
☐ 04. bivariate correlation (r or r^2) = __________
☐ 05. coefficient of determination (R or R^2) = ________
☐ 06. Adjusted R^2 (Wherry) = __________
☐ 07. Cohen's d (d) = ____________
☐ 08. Cohen's k (k) = ____________
☐ 09. Glass' delta (Δ) = ____________
☐ 10. Phi squared ($\square^2$) = __________
☐ 11. other (please specify) __________________________
☐ 12. effect size reported, but type of measure not specified = ____________

30. If the analysis for major study hypothesis #3 was factorial (e.g., 2-Way ANOVA), were any interaction effects involving the empirically validated practice statistically significant?
☐ 01. Yes ☐ 02. No

31. If yes, briefly describe the nature of the interaction (e.g., the treatment was more effective for children with more significant disabilities) ____________________________________
____
____
____
____
____
____

32. For major study hypothesis #4 is an effect size measure reported?
☐ 01. Yes ☐ 02. No

33. If yes, check type of measure reported and list value.

☐ 01. eta squared ($\square^2$) = __________
☐ 02. omega squared ($\square^2$) = __________
☐ 03. multivariate lambda (□, e.g., Wilks' lambda) = __________
☐ 04. bivariate correlation (r or r^2) = __________
☐ 05. coefficient of determination (R or R^2) = ________
☐ 06. Adjusted R^2 (Wherry) = __________
☐ 07. Cohen's d (d) = ____________
☐ 08. Cohen's k (k) = ____________
☐ 09. Glass' delta (Δ) = ____________
☐ 10. Phi squared ($\square^2$) = __________
☐ 11. other (please specify) __________________________
☐ 12. effect size reported, but type of measure not specified = ____________

Name of Coder ______________________

34. If the analysis for major study hypothesis #4 was factorial (e.g., 2-Way ANOVA), were any interaction effects involving the empirically validated practice statistically significant?
☐ 01. Yes ☐ 02. No

35. If yes, briefly describe the nature of the interaction (e.g., the treatment was more effective for children with more significant disabilities) ______________________________________
____
____
____
____
____
____

If additional hypotheses are listed above, put answers to the questions related to effect size and factorial results on the back of this page.

Name of Coder ______________________

RECOMMENDED PRACTICES

Please write all recommended practice(s) supported in the study. Practices may be supported by the data even if the authors' conclusions do not explicitly acknowledge them. Practices may be related to contextual variables in addition to, or instead of, the variable(s) examined in the study. Recommended practices are written in the present tense, using active voice, with people as the subject of the sentence. An example of a specified practice gleaned from quantitative literature for use as a model follows.

Exemplar

> *Adults provide opportunities for young children with hearing impairments to play with peers who are not hearing impaired to increase play complexity.*

Recommended Practice #1. ____

Check the most appropriate strand placement for the above identified recommended practice.

Recommended Practice #1

____ 01. Child-focused
____ 02. Family-centered
____ 03. Cultural/linguistic competency
____ 04. Technology application
____ 05. Learning environments
____ 06. Interdisciplinary models
____ 07. Policy and procedure
____ 08. Personnel development
____ 09. Systems change, maintenance and leadership climate
____ 10. Assessment
____ 11. Other (please specify) ______________________

Recommended Practice #2. ____

Name of Coder ____________________

Check the most appropriate strand placement for the above identified recommended practice.

Recommended Practice #2

____ 01. Child-focused
____ 02. Family-centered
____ 03. Cultural/linguistic competency
____ 04. Technology application
____ 05. Learning environments
____ 06. Interdisciplinary models
____ 07. Policy and procedure
____ 08. Personnel development
____ 09. Systems change, maintenance and leadership climate
____ 10. Assessment
____ 11. Other (please specify) ____________________

Recommended Practice #3. ____

Check the most appropriate strand placement for the above identified recommended practice.

Recommended Practice #3

____ 01. Child-focused
____ 02. Family-centered
____ 03. Cultural/linguistic competency
____ 04. Technology application
____ 05. Learning environments
____ 06. Interdisciplinary models
____ 07. Policy and procedure
____ 08. Personnel development
____ 09. Systems change, maintenance and leadership climate
____ 10. Assessment
____ 11. Other (please specify) ____________________

Recommended Practice #4. ____

Name of Coder ____________________

Name of Coder ____________________

Check the most appropriate strand placement for the above identified recommended practice.

Recommended Practice #4

____ 01. Child-focused
____ 02. Family-centered
____ 03. Cultural/linguistic competency
____ 04. Technology application
____ 05. Learning environments
____ 06. Interdisciplinary models
____ 07. Policy and procedure
____ 08. Personnel development
____ 09. Systems change, maintenance and leadership climate
____ 10. Assessment
____ 11. Other (please specify) ____________________

If additional empirically validated practices are listed above, write them and the most appropriate strand placement on the back of this page or on a continuation page.

Name of Coder ______________________ (Rev. 5/12/99)

PART B: SPECIALIZED CODING SHEET FOR SINGLE SUBJECT STUDIES

1. Design Type
   - ☐ 01. Withdrawal of treatment
   - ☐ 02. Reversal
   - ☐ 03. Multiple baseline across subjects, settings, etc.
   - ☐ 04. Multiple probe
   - ☐ 05. Simultaneous treatment
   - ☐ 06. Alternating treatment
   - ☐ 07. Other ______________

2. Interpersonal Ratio
   - ☐ 01. Pull-out individual/separate
   - ☐ 02. Group/integrated
   - ☐ 03. Other __________
   - ☐ 04. Not specified

3. Action Agent
   - ☐ 01. Adult-guided
   - ☐ 02. Peer-mediated
   - ☐ 03. Other __________

4. Number of Replications (e.g., multiple baseline across three settings=3 replications; ABAB with 4 subjects=8 replications

5. Describe Dependent Variable Ultimately Plotted (e.g., % intervals of engagement; rate of tantrums; % of corrects/errors)

6. Describe Independent Variable

7. Independent Variable Assessment
   - ☐ 01. Yes
   - ☐ 02. No

Name of Coder ______________________________

8. If yes, fidelity of intervention was:
   - ☐ 01. High
   - ☐ 02. Medium
   - ☐ 03. Low

9. Evidence of Improvement Over Time
   Within Phase(s)
   - ☐ 01. Yes
   - ☐ 02. No

10. Across Phase(s)
    - ☐ 01. Yes
    - ☐ 02. No

11. Social Validity Assessments Included
    Intervention Acceptability
    - ☐ 01. Yes
    - ☐ 02. No

12. Outcome Acceptability/Acknowledgment
    - ☐ 01. Yes
    - ☐ 02. No

13. Evidence of Intervention Maintenance Across Time
    - ☐ 01. Yes
    - ☐ 02. No

14. If yes, length of follow-up ______________

15. Evidence of Intervention Generalization
    - ☐ 01. Yes
    - ☐ 02. No

16. If yes, degree of match with intervention performance:
    - ☐ 01. High
    - ☐ 02. Medium
    - ☐ 03. Low

RECOMMENDED PRACTICES

Please write all recommended practice(s) supported in the study. Practices may be supported by the data even if the authors□ conclusions do not explicitly acknowledge them. Practices may be related to contextual variables in addition to, or instead of, the variable(s) examined in the study. Recommended practices are written in the present tense, using active voice, with people as the subject of the sentence. Examples of specified practices gleaned from the singe subject literature for use as models follows.

Name of Coder ______________________________

Exemplars

1) *Teachers embed instructional opportunities into routine class transitions to increase learning outcomes for children with mild developmental disabilities.*

2) *Practitioners teach mothers of preschoolers with language impairments to use effectively a variety of milieu teaching strategies (e.g., model, mand-model, time delay, and incidental) in home settings for increasing the amount and complexity of children's language production.*

17. Recommended Practice #1. ____

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18. Check the suggested strand placement for the above identified recommended practice.

Recommended Practice #1

- ☐ 01. Child-focused
- ☐ 02. Family-centered
- ☐ 03. Cultural/linguistic competency
- ☐ 04. Technology application
- ☐ 05. Learning environments
- ☐ 06. Interdisciplinary models
- ☐ 07. Policy and procedure
- ☐ 08. Personnel development
- ☐ 09. Systems change, maintenance and leadership climate
- ☐ 10. Assessment
- ☐ 11. Other (please specify) ______________________________

19. Recommended Practice #2. ____

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Name of Coder ______________________

20. Check the suggested strand placement for the above identified recommended practice.

Recommended Practice #2

☐ 01. Child-focused
☐ 02. Family-centered
☐ 03. Cultural/linguistic competency
☐ 04. Technology application
☐ 05. Learning environments
☐ 06. Interdisciplinary models
☐ 07. Policy and procedure
☐ 08. Personnel development
☐ 09. Systems change, maintenance and leadership climate
☐ 10. Assessment
☐ 11. Other (please specify) ______________________

21. Recommended Practice #3. ______________________

22. Check the suggested strand placement for the above identified recommended practice.

Recommended Practice #3

☐ 01. Child-focused
☐ 02. Family-centered
☐ 03. Cultural/linguistic competency
☐ 04. Technology application
☐ 05. Learning environments
☐ 06. Interdisciplinary models
☐ 07. Policy and procedure
☐ 08. Personnel development
☐ 09. Systems change, maintenance and leadership climate
☐ 10. Assessment
☐ 11. Other (please specify) ______________________

23. Recommended Practice #4. ______________________

Name of Coder ______________________________

24. Check the suggested strand placement for the above identified recommended practice.

Recommended Practice #4

- ☐ 01. Child-focused
- ☐ 02. Family-centered
- ☐ 03. Cultural/linguistic competency
- ☐ 04. Technology application
- ☐ 05. Learning environments
- ☐ 06. Interdisciplinary models
- ☐ 07. Policy and procedure
- ☐ 08. Personnel development
- ☐ 09. Systems change, maintenance and leadership climate
- ☐ 10. Assessment
- ☐ 11. Other (please specify) ______________________________

If you have identified additional empirically validated practices, write them and the most appropriate strand placement on the back of this page or on a continuation page.

Name of Coder ______________________ (Rev. 5/31/99)

PART B: SPECIALIZED CODING SHEET
SHORT-FORM FOR SURVEY/DESCRIPTIVE

1. Were participants randomly selected from a defined population? ☐ 01. Yes ☐ 02. No

2. Were participants randomly assigned to groups? ☐ 01. Yes ☐ 02. No

3. Were participants matched on any attribute variables? ☐ 01. Yes ☐ 02. No

4. If yes, list (e.g., developmental age) ______________________________

5. Was information provided about reliability/agreement of study measures?01. Yes ☐ 02. No

6. If yes, what type(s) of reliability/agreement data were provided? (check all that apply)
   ☐ 01. Test-retest
   ☐ 02. Internal consistency (e.g., Cronbach's alpha)
   ☐ 03. Parallel forms
   ☐ 04. Interrater
   ☐ 05. Standard error of measurement
   ☐ 06. Interobserver agreement

7. Were reported reliability coefficients based on data obtained from the study sample?
   ☐ 01. Yes ☐ 02. No ☐ 03. Not Applicable

8. Was information provided about the validity of study measures? ☐ 01. Yes ☐ 02. No

9. If yes, what type(s) of validity data were provided? (check all that apply)
   ☐ 01. Face/content
   ☐ 02. Predictive validity
   ☐ Concurrent validity
   ☐ Construct (e.g., factor analytic evidence)
   ☐ 05. Other (specify) ______________

10. If yes, were reported validity coefficients based on data obtained from the study sample?
    ☐ 01. Yes ☐ 02. No ☐ 03. Not Applicable

Name of Coder ________________________

RECOMMENDED PRACTICES

Please write all recommended practice(s) supported in the study. Practices may be supported by the data even if the authors' conclusions do not explicitly acknowledge them. Practices may be related to contextual variables in addition to, or instead of, the variable(s) examined in the study. Recommended practices are written in the present tense, using active voice, with people as the subject of the sentence. An example of a specified practice gleaned from quantitative literature for use as a model follows.

Exemplar

> *Adults should provide opportunities for young children with hearing impairments to play with peers who are not hearing impaired to increase play complexity.*

Recommended Practice #1. ____
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Check the most appropriate strand placement for the above identified recommended practice.

Recommended Practice #1

____ 01. Child-focused
____ 02. Family-centered
____ 03. Cultural/linguistic competency
____ 04. Technology application
____ 05. Learning environments
____ 06. Interdisciplinary models
____ 07. Policy and procedure
____ 08. Personnel development
____ 09. Systems change, maintenance and leadership climate
____ 10. Assessment
____ 11. Other (please specify) ________________________

Recommended Practice #2. ____
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Name of Coder ____________________

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Check the most appropriate strand placement for the above identified recommended practice.

Recommended Practice #2

____ 01. Child-focused
____ 02. Family-centered
____ 03. Cultural/linguistic competency
____ 04. Technology application
____ 05. Learning environments
____ 06. Interdisciplinary models
____ 07. Policy and procedure
____ 08. Personnel development
____ 09. Systems change, maintenance and leadership climate
____ 10. Assessment
____ 11. Other (please specify) ____________________

Recommended Practice #3. ____

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Check the most appropriate strand placement for the above identified recommended practice.

Recommended Practice #3

____ 01. Child-focused
____ 02. Family-centered
____ 03. Cultural/linguistic competency
____ 04. Technology application
____ 05. Learning environments
____ 06. Interdisciplinary models
____ 07. Policy and procedure
____ 08. Personnel development
____ 09. Systems change, maintenance and leadership climate
____ 10. Assessment
____ 11. Other (please specify) ____________________

Name of Coder ____________________

Recommended Practice #4. ____
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Check the most appropriate strand placement for the above identified recommended practice.

Recommended Practice #4

____ 01. Child-focused
____ 02. Family-centered
____ 03. Cultural/linguistic competency
____ 04. Technology application
____ 05. Learning environments
____ 06. Interdisciplinary models
____ 07. Policy and procedure
____ 08. Personnel development
____ 09. Systems change, maintenance and leadership climate
____ 10. Assessment
____ 11. Other (please specify) ____________________

If additional empirically validated practices are listed above, write them and the most appropriate strand placement on the back of this page or on a continuation page.

Name of Coder ______________________ (Rev. 7/12/99)

SPECIALIZED CODING SHEET FOR MIXED METHOD STUDIES
SECTION I (QUANTITATIVE)

A. Sampling - Sampling refers to processes associated with participant selection and assignment to groups

1. Were participants randomly selected from a defined population? ☐ 01. Yes ☐ 02. No

2. Were participants randomly assigned to groups? ☐ 01. Yes ☐ 02. No

3. Were participants matched on any attribute variables? ☐ 01. Yes ☐ 02. No

4. If yes, list (e.g., developmental age) ______________________

5. Was a control group (i.e., group that received **no** treatment) used? ☐ 01. Yes ☐ 02. No

6. Was a covariate(s) used? ☐ 01. Yes ☐ 02. No

7. If yes, please list the covariate(s). ______________________

B. Independent Variable(s) and Associated Categories - Independent variables encompass variables actively manipulated by the researcher (i.e., experimental variables) and attribute variables (i.e., assigning participants to groups based on an attribute such as "severity of disability"), which are examined as part of substantive hypothesis(es)

List, or briefly describe, the independent variable(s) **and** the categories associated with the variable(s):

IV #1: ______________________

Categories associated with IV #1: ______________________

IV #2 (if applicable): ______________________

Categories associated with IV #2: ______________________

Name of Coder ______________________

IV #3 (if applicable): ______________________

Categories associated with IV #3: ______________________

(if applicable, list other IVs and associated categories on back of page)

If the study is pre-experimental (i.e., everyone receives the same treatment or is assigned to a single category of treatment) or causal comparative (i.e, "independent variable" being examined is an attribute or ability variable that cannot be manipulated by the researcher), briefly describe the "treatment" experienced by all participants: ______________________

C. Fidelity of Treatment

8. Did the author(s) provide information related to fidelity of treatment implementation?
☐ 01. Yes ☐ 02. No

9. If yes, briefly describe. ______________________

E. Duration of Study

10a. Information provided about length of intervention or treatment received? ☐ 01. Yes ☐ No.

10b. If yes, check all that apply.
- ☐ 01. Length in hours/minutes ____
- ☐ 02. Length in days ____
- ☐ 03. Length in months ____
- ☐ 04. Frequency of sessions ____
- ☐ 05. Length of sessions (e.g., minutes, hours, if specified) ____
- ☐ 06. Other duration data ____

E. Dependent Variable(s) and Dependent Measure(s)

List, or briefly describe, the dependent variable(s) **and** the dependent measures used to define the variable(s):

DV #1: ______________________

Name of Coder ______________________________

Dependent Measure #1: ____

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DV #2 (if applicable): ____

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Dependent Measure #2 (if applicable): ______________________________________

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DV #3 (if applicable): ____

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Dependent Measure #3 (if applicable): ______________________________________

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(if applicable, list other DVs and associated dependent measures on back of page)

11. Was information provided about reliability/agreement of study measures?
☐ 01. Yes ☐ 02. No

12. If yes, what type(s) of reliability/agreement data were provided? (check all that apply)
☐ 01. Test-retest
☐ 02. Internal consistency (e.g., Cronbach's alpha)
☐ 03. Parallel forms
☐ 04. Interrater reliability
☐ 05. Standard error of measurement
☐ 06. Interobserver agreement

13. Were reported reliability coefficients based on data obtained from the study sample?
☐ 01. Yes ☐ 02. No ☐ 03. Not Applicable

14. Was information provided about the validity of study measures? ☐ 01. Yes ☐ 02. No

Name of Coder ______________________________

15. If yes, what type(s) of validity data were provided? (check all that apply)
☐ 01. Face/content
☐ 02. Predictive validity
☐ 03. Concurrent validity
☐ 04. Construct (e.g., factor analytic evidence)
☐ 05. Other (specify) ____________________

16. Were reported validity coefficients based on data obtained from the study sample?
☐ 01. Yes ☐ 02. No ☐ 03. Not Applicable

17. For dependent measures involving observational data collection, were measures of interobserver agreement or reliability calculated? ☐ 01. Yes ☐ 02. No
☐ 03. Not Applicable

18. If yes, what type(s) of agreement or reliability index was provided? (check all that apply)
☐ 01. Simple agreement
☐ 02. Kappa
☐ 03. Weighted kappa
☐ 04. Intraclass correlation coefficient (ICC)
☐ 05. Other (specify) ____

F. Major Study Hypothesis(es)

List the major substantive hypothesis(es) evaluated by the author(s):

Hypothesis #1 ____

Hypothesis #2 (if applicable): ____

Hypothesis #3 (if applicable): ____

Name of Coder ____________________________

Hypothesis #4 (if applicable): ____

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(if applicable, list other hypotheses on the back of page)

G. Statistical Analyses

19. Which of the following types of inferential statistics were used to test the hypotheses listed above? (check all that apply)

☐ 01. Univariate parametric statistics (e.g., t-tests, ANOVA, multiple regression, Pearson r)
☐ 02. Univariate nonparametric statistics (e.g., Spearman rho, Mann Whitney U Test, chi square contingency table, Friedman 2-Way ANOVA, Wilcoxon matched pairs sign rank test)
☐ 03. Multivariate parametric statistics (e.g., MANOVA, discriminant analysis, canonical correlation analysis)
☐ 04. Multivariate nonparametric statistics (e.g., logistic regression)
☐ 05. Other (e.g., Structural Equation Modeling [SEM], Confirmatory Factor Analysis, Hierarchical Linear Models [HLM)]), please specify ______________________

H. Effect Size(s) for Major Study Hypothesis(es) and Empirically Validated Practice(s):

20. For major study hypothesis #1 is an effect size measure reported?
☐ 01. Yes ☐ 02. No

21. If yes, check type of measure reported and list value.

☐ 01. eta squared ($\square^2$) = __________
☐ 02. omega squared ($\square^2$) = __________
☐ 03. multivariate lambda (□, e.g., Wilks' lambda) = __________
☐ 04. bivariate correlation (r or r^2) = __________
☐ 05. coefficient of determination (R or R^2) = ________
☐ 06. Adjusted R^2 (Wherry) = __________
☐ 07. Cohen's d (d) = ____________
☐ 08. Cohen's k (k) = ____________
☐ 09. Glass' delta (Δ) = ____________
☐ 10. Phi squared ($\square^2$) = __________
☐ 11. other (please specify) ________________________
☐ 12. effect size reported, but type of measure not specified = ____________

22. If the analysis for major study hypothesis #1 was factorial (e.g., 2-Way ANOVA), were any interactions statistically significant? ☐ 01. Yes ☐ 02. No

Name of Coder ______________________________

23. If yes, briefly describe the nature of the interactions (e.g., the treatment was more effective for children with more significant disabilities) ______________________________

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24. For major study hypothesis #2 is an effect size measure reported?
☐ 01. Yes ☐ 02. No

25. If yes, check type of measure reported and list value.

☐ 01. eta squared ($\Box^2$) = __________
☐ 02. omega squared ($\Box^2$) = __________
☐ 03. multivariate lambda (□, e.g., Wilks' lambda) = __________
☐ 04. bivariate correlation (r or r^2) = __________
☐ 05. coefficient of determination (R or R^2) = ________
☐ 06. Adjusted R^2 (Wherry) = __________
☐ 07. Cohen's d (d) = ____________
☐ 08. Cohen's k (k) = ____________
☐ 09. Glass' delta (Δ) = ____________
☐ 10. Phi squared ($\Box^2$) = __________
☐ 11. other (please specify) ____________________________
☐ 12. effect size reported, but type of measure not specified = ____________

26. If the analysis for major study hypothesis #2 was factorial (e.g., 2-Way ANOVA), were any interaction effects involving the empirically validated practice statistically significant?
☐ 01. Yes ☐ 02. No

27. If yes, briefly describe the nature of the interaction (e.g., the treatment was more effective for children with more significant disabilities) ______________________________

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28. For major study hypothesis #3 is an effect size measure reported?
☐ 01. Yes ☐ 02. No

Name of Coder __________________________

29. If yes, check type of measure reported and list value.

☐ 01. eta squared ($\square^2$) = __________
☐ 02. omega squared ($\square^2$) = __________
☐ 03. multivariate lambda (□, e.g., Wilks' lambda) = __________
☐ 04. bivariate correlation (r or r^2) = __________
☐ 05. coefficient of determination (R or R^2) = ________
☐ 06. Adjusted R^2 (Wherry) = __________
☐ 07. Cohen's d (d) = ____________
☐ 08. Cohen's k (k) = ____________
☐ 09. Glass' delta (Δ) = ____________
☐ 10. Phi squared ($\square^2$) = __________
☐ 11. other (please specify) __________________________
☐ 12. effect size reported, but type of measure not specified = ____________

30. If the analysis for major study hypothesis #3 was factorial (e.g., 2-Way ANOVA), were any interaction effects involving the empirically validated practice statistically significant?
☐ 01. Yes ☐ 02. No

31. If yes, briefly describe the nature of the interaction (e.g., the treatment was more effective for children with more significant disabilities) ____________________________________
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32. For major study hypothesis #4 is an effect size measure reported?
☐ 01. Yes ☐ 02. No

33. If yes, check type of measure reported and list value.

☐ 01. eta squared ($\square^2$) = __________
☐ 02. omega squared ($\square^2$) = __________
☐ 03. multivariate lambda (□, e.g., Wilks' lambda) = __________
☐ 04. bivariate correlation (r or r^2) = __________
☐ 05. coefficient of determination (R or R^2) = ________
☐ 06. Adjusted R^2 (Wherry) = __________
☐ 07. Cohen's d (d) = ____________
☐ 08. Cohen's k (k) = ____________
☐ 09. Glass' delta (Δ) = ____________
☐ 10. Phi squared ($\square^2$) = __________
☐ 11. other (please specify) __________________________
☐ 12. effect size reported, but type of measure not specified = ____________

Name of Coder ______________________________

34. If the analysis for major study hypothesis #4 was factorial (e.g., 2-Way ANOVA), were any interaction effects involving the empirically validated practice statistically significant?
☐ 01. Yes ☐ 02. No

35. If yes, briefly describe the nature of the interaction (e.g., the treatment was more effective for children with more significant disabilities) ____

If additional hypotheses are listed above, put answers to the questions related to effect size and factorial results on the back of this page.

Name of Coder ______________________

RECOMMENDED PRACTICES

Please write all recommended practice(s) supported in the study. Practices may be supported by the data even if the authors' conclusions do not explicitly acknowledge them. Practices may be related to contextual variables in addition to, or instead of, the variable(s) examined in the study. Recommended practices are written in the present tense, using active voice, with people as the subject of the sentence. An example of a specified practice gleaned from quantitative literature for use as a model follows.

Exemplar

> *Adults provide opportunities for young children with hearing impairments to play with peers who are not hearing impaired to increase play complexity.*

Recommended Practice #1. ____

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Check the most appropriate strand placement for the above identified recommended practice.

Recommended Practice #1

____ 01. Child-focused
____ 02. Family-centered
____ 03. Cultural/linguistic competency
____ 04. Technology application
____ 05. Learning environments
____ 06. Interdisciplinary models
____ 07. Policy and procedure
____ 08. Personnel development
____ 09. Systems change, maintenance and leadership climate
____ 10. Assessment
____ 11. Other (please specify) ________________

Recommended Practice #2. ____

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Name of Coder ____________________

Check the most appropriate strand placement for the above identified recommended practice.

Recommended Practice #2

____ 01. Child-focused
____ 02. Family-centered
____ 03. Cultural/linguistic competency
____ 04. Technology application
____ 05. Learning environments
____ 06. Interdisciplinary models
____ 07. Policy and procedure
____ 08. Personnel development
____ 09. Systems change, maintenance and leadership climate
____ 10. Assessment
____ 11. Other (please specify) ____________________

Recommended Practice #3. ____________________

Check the most appropriate strand placement for the above identified recommended practice.

Recommended Practice #3

____ 01. Child-focused
____ 02. Family-centered
____ 03. Cultural/linguistic competency
____ 04. Technology application
____ 05. Learning environments
____ 06. Interdisciplinary models
____ 07. Policy and procedure
____ 08. Personnel development
____ 09. Systems change, maintenance and leadership climate
____ 10. Assessment
____ 11. Other (please specify) ____________________

Recommended Practice #4. ____________________

Name of Coder ____________________________

Check the most appropriate strand placement for the above identified recommended practice.

Recommended Practice #4

____ 01. Child-focused
____ 02. Family-centered
____ 03. Cultural/linguistic competency
____ 04. Technology application
____ 05. Learning environments
____ 06. Interdisciplinary models
____ 07. Policy and procedure
____ 08. Personnel development
____ 09. Systems change, maintenance and leadership climate
____ 10. Assessment
____ 11. Other (please specify) ______________________

If additional empirically validated practices are listed above, write them and the most appropriate strand placement on the back of this page or on a continuation page.

Name of Coder ____________________ (Rev. 5/31/99)

SPECIALIZED CODING SHEET FOR MIXED METHOD STUDIES
SECTION II (QUALITATIVE)

1. Includes a description of the conceptual framework.
   - ☐ 01. Yes
   - ☐ 02. No

2. What is the general focus of the study? ____________________

3. Number of study participants. ________

4. Type of study.
   - ☐ 01. Ethnographic
   - ☐ 02. Naturalistic
   - ☐ 03. Interpretive
   - ☐ 04. Case study
   - ☐ 05. Participant observation
   - ☐ 06. Phenomenological
   - ☐ 07. Historical
   - ☐ 08. Other (please specify) ____________________

5. Includes a description of the procedures.
   - ☐ 01. Participant selection
   - ☐ 02. Data collection methods

6. Data source(s). (Check all that apply)
   - ☐ 01. Observation
   - ☐ 02. Interviews
   - ☐ 03. Documents
   - ☐ 04. Combination of data sources (please describe) ________________
   - ☐ 05. Other (please specify) ____________________

7. What was the length of the data collection period? ____________

8. Includes description of data analysis. (Check all that apply)
   - ☐ 01. Detailed
   - ☐ 02. Appropriate
   - ☐ 03. Inductive

9. Evidence of credibility. (Check all that apply)
   - ☐ 01. Multiple methods
   - ☐ 02. Member checks
   - ☐ 03. Audit trail
   - ☐ 04. Triangulation across methods
   - ☐ 05. Triangulation across sources
   - ☐ 06. Intercoder reliability checks
   - ☐ 07. Other (please specify) ____________________

Name of Coder ______________________________

10. Includes a discussion of the meaning of the findings in terms of theory.

☐ 01. Yes
☐ 02. No

RECOMMENDED PRACTICES

Please write all recommended practice(s) supported in the study. Practices may be supported by the data even if the authors' conclusions do not explicitly acknowledge them. Practices may be related to contextual variables in addition to, or instead of, the variable(s) examined in the study. Recommended practices are written in the present tense, using active voice, with people as the subject of the sentence. Examples of specified practices gleaned from qualitative literature for use as models follow.

Exemplars

1) *Program staff including therapists should explain to families the advantages and disadvantages of different therapy delivery models (e.g., home versus clinic-based).*

2) *Program staff including therapists should explain to families the pros and cons related to frequency of the delivery of therapy services. (e.g., once per week, once per month, not at all).*

3) *Professionals should use skills that facilitate the communication process, such as listening skills, openness to suggestions, responsivity and a willingness to disclose information to promote collaboration with families.*

11. Recommended Practice #1. ____

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12. Check the most appropriate strand placement for the above identified recommended practice.

Recommended Practice #1

☐ 01. Child-focused
☐ 02. Family-centered
☐ 03. Cultural/linguistic competency
☐ 04. Technology application
☐ 05. Learning environments
☐ 06. Interdisciplinary models
☐ 07. Policy and procedure
☐ 08. Personnel development
☐ 09. Systems change, maintenance and leadership climate
☐ 10. Assessment
☐ 11. Other (please specify) ______________________

Name of Coder ______________________

13. Recommended Practice #2. ____

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14. Check the most appropriate strand placement for the above identified recommended practice.

Recommended Practice #2

- ☐ 01. Child-focused
- ☐ 02. Family-centered
- ☐ 03. Cultural/linguistic competency
- ☐ 04. Technology application
- ☐ 05. Learning environments
- ☐ 06. Interdisciplinary models
- ☐ 07. Policy and procedure
- ☐ 08. Personnel development
- ☐ 09. Systems change, maintenance and leadership climate
- ☐ 10. Assessment
- ☐ 11. Other (please specify) ______________________

15. Recommended Practice #3. ____

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16. Check the most appropriate strand placement for the above identified recommended practice.

Recommended Practice #3

- ☐ 01. Child-focused
- ☐ 02. Family-centered
- ☐ 03. Cultural/linguistic competency
- ☐ 04. Technology application
- ☐ 05. Learning environments
- ☐ 06. Interdisciplinary models
- ☐ 07. Policy and procedure
- ☐ 08. Personnel development
- ☐ 09. Systems change, maintenance and leadership climate
- ☐ 10. Assessment
- ☐ 11. Other (please specify) ______________________

Name of Coder ______________________________

17. Recommended Practice #4. ____
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18. Check the most appropriate strand placement for the above identified recommended practice.

Recommended Practice #4

☐ 01. Child-focused
☐ 02. Family-centered
☐ 03. Cultural/linguistic competency
☐ 04. Technology application
☐ 05. Learning environments
☐ 06. Interdisciplinary models
☐ 07. Policy and procedure
☐ 08. Personnel development
☐ 09. Systems change, maintenance and leadership climate
☐ 10. Assessment
☐ 11. Other (please specify) ______________________________

If you have identified additional empirically validated practices, write them and the most appropriate strand placement on the back of this page or on a continuation page.

Name of Coder ______________________________ (Rev. 5/12/99)

SPECIALIZED CODING SHEET FOR MIXED METHOD STUDIES
SECTION III (SINGLE SUBJECT)

1. Design Type
   - ☐ 01. Withdrawal of treatment
   - ☐ 02. Reversal
   - ☐ 03. Multiple baseline across subjects, settings, etc.
   - ☐ 04. Multiple probe
   - ☐ 05. Simultaneous treatment
   - ☐ 06. Alternating treatment
   - ☐ 07. Other ___________________

2. Interpersonal Ratio
   - ☐ 01. Pull-out individual/separate
   - ☐ 02. Group/integrated
   - ☐ 03. Other _____________
   - ☐ 04. Not specified

3. Action Agent
   - ☐ 01. Adult-guided
   - ☐ 02. Peer-mediated
   - ☐ 03. Other _____________

4. Number of Replications (e.g., multiple baseline across three settings=3 replications; ABAB with 4 subjects=8 replications

5. Describe Dependent Variable Ultimately Plotted (e.g., % intervals of engagement; rate of tantrums; % of corrects/errors)

6. Describe Independent Variable

7. Independent Variable Assessment
   - ☐ 01. Yes
   - ☐ 02. No

Name of Coder ____________________

8. If yes, fidelity of intervention was:
   - ☐ 01. High
   - ☐ 02. Medium
   - ☐ 03. Low

9. Evidence of Improvement Over Time
   Within Phase(s)
   - ☐ 01. Yes
   - ☐ 02. No

10. Across Phase(s)
   - ☐ 01. Yes
   - ☐ 02. No

11. Social Validity Assessments Included
   Intervention Acceptability
   - ☐ 01. Yes
   - ☐ 02. No

12. Outcome Acceptability/Acknowledgment
   - ☐ 01. Yes
   - ☐ 02. No

13. Evidence of Intervention Maintenance Across Time
   - ☐ 01. Yes
   - ☐ 02. No

14. If yes, length of follow-up ______________

15. Evidence of Intervention Generalization
   - ☐ 01. Yes
   - ☐ 02. No

16. If yes, degree of match with intervention performance:
   - ☐ 01. High
   - ☐ 02. Medium
   - ☐ 03. Low

RECOMMENDED PRACTICES

Please write all recommended practice(s) supported in the study. Practices may be supported by the data even if the authors conclusions do not explicitly acknowledge them. Practices may be related to contextual variables in addition to, or instead of, the variable(s) examined in the study. Recommended practices are written in the present tense, using active voice, with people as the subject of the sentence. Examples of specified practices gleaned from the singe subject literature for use as models follows.

Name of Coder ______________________

Exemplars

1) Teachers embed instructional opportunities into routine class transitions to increase learning outcomes for children with mild developmental disabilities.

2) Practitioners teach mothers of preschoolers with language impairments to use effectively a variety of milieu teaching strategies (e.g., model, mand-model, time delay, and incidental) in home settings for increasing the amount and complexity of children's language production.

17. Recommended Practice #1. ____

18. Check the suggested strand placement for the above identified recommended practice.

Recommended Practice #1

☐ 01. Child-focused
☐ 02. Family-centered
☐ 03. Cultural/linguistic competency
☐ 04. Technology application
☐ 05. Learning environments
☐ 06. Interdisciplinary models
☐ 07. Policy and procedure
☐ 08. Personnel development
☐ 09. Systems change, maintenance and leadership climate
☐ 10. Assessment
☐ 11. Other (please specify) ______________________

19. Recommended Practice #2. ____

20. Check the suggested strand placement for the above identified recommended practice.

Name of Coder ______________________________

Recommended Practice #2

- ☐ 01. Child-focused
- ☐ 02. Family-centered
- ☐ 03. Cultural/linguistic competency
- ☐ 04. Technology application
- ☐ 05. Learning environments
- ☐ 06. Interdisciplinary models
- ☐ 07. Policy and procedure
- ☐ 08. Personnel development
- ☐ 09. Systems change, maintenance and leadership climate
- ☐ 10. Assessment
- ☐ 11. Other (please specify) ______________________

21. Recommended Practice #3. ____
____
____
____
____
____
____

22. Check the suggested strand placement for the above identified recommended practice.

Recommended Practice #3

- ☐ 01. Child-focused
- ☐ 02. Family-centered
- ☐ 03. Cultural/linguistic competency
- ☐ 04. Technology application
- ☐ 05. Learning environments
- ☐ 06. Interdisciplinary models
- ☐ 07. Policy and procedure
- ☐ 08. Personnel development
- ☐ 09. Systems change, maintenance and leadership climate
- ☐ 10. Assessment
- ☐ 11. Other (please specify) ______________________

23. Recommended Practice #4. ____
____
____
____
____
____
____

24. Check the suggested strand placement for the above identified recommended practice.

Name of Coder ______________________

Recommended Practice #4

☐ 01. Child-focused
☐ 02. Family-centered
☐ 03. Cultural/linguistic competency
☐ 04. Technology application
☐ 05. Learning environments
☐ 06. Interdisciplinary models
☐ 07. Policy and procedure
☐ 08. Personnel development
☐ 09. Systems change, maintenance and leadership climate
☐ 10. Assessment
☐ 11. Other (please specify) ______________________

If you have identified additional empirically validated practices, write them and the most appropriate strand placement on the back of this page or on a continuation page.

Appendix C

Manuscripts

Analyses of the Literature Review That Contributed to the DEC Recommended Practices:

Nine Years of EI/ECSE Research

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W. Carl Sumi

State of Hawaii, Department of Health

Submitted to JEI, March, 2002

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Author Note: The authors wish to acknowledge the contributions of Dr. David Sexton, Louisiana State University Health Sciences Center, to the research effort that led to the DEC Recommended Practices in Early Intervention/Early Childhood Special Education and this manuscript.

Abstract

Results are reported from an analysis of the research literature involving children with disabilities, age birth through five, their families, the personnel who serve them and policies and systems change strategies related to the provision of services. The work reported in this paper was one part of a national effort by the Division for Early Childhood (DEC) of the Council for Exceptional Children (CEC) and several participating Universities to develop a set of evidence-based recommended practices for the field. Research articles appearing in 48 peer-reviewed journals from 1990 to 1998 were reviewed. Analyses of the literature review data-base reveal trends in research methods used for studying particular topics, as well as information about populations and settings that have been studied during this time period. The authors suggest implications for future research in EI/ECSE.

For over 30 years, literature in early intervention/early childhood special education (EI/ECSE) has reported strategies, methods, and tools for improving the developmental and educational outcomes for young children with disabilities (Guralnick, 1997; Meisels & Shonkoff, 1990; Tjossem, 1976; White, Mastropieri, & Casto, 1984). Previous efforts to synthesize the EI/ECSE knowledge base have been limited. For example, in the 1980s researchers employed meta-analytic techniques to synthesize the early intervention efficacy literature (Casto & Mastroprieri, 1986; Casto, White, & Taylor, 1983); however, large bodies of relevant research (e.g., single-subject and qualitative studies) were not included in the synthesis (Dunst & Snyder, 1986; Strain & Smith, 1986).

Another effort to summarize the EI/ECSE knowledge base, sponsored by the Division for Early Childhood (DEC) of the Council for Exceptional Children (CEC), was conducted in 1991. Recommended practices in fourteen areas, called "strands", were generated by groups composed of researchers, practitioners, representatives from higher education, and families. These practices were subsequently validated by a national sample of 500 individuals representing these stakeholder groups. The resulting list of 405 practices, first published in 1993 in a DEC document (DEC Task Force on Recommended Practices, 1993) was later followed by a book (Odom & McLean, 1996) that further explained the practices. Although this effort was generally well received, the passage of time and limitations associated with the 1991 effort signaled the need for an updated set of practices and a more systematic and comprehensive synthesis of research and practices in EI/ECSE (Garland, 1995; Wolery, 1995). The 1991 DEC practices were derived solely from stakeholder focus groups; no systematic review of the scientific literature was conducted to validate the extent to which the recommended practices were supported with research evidence. Additionally, the recommendations only addressed direct services and personnel development. There were no recommendations for administration or policy support necessary for the delivery of quality direct services. Finally, the landscape of EI/ECSE has changed significantly since DEC's 1991 work on the original recommended practices project. The number of preschool programs has grown dramatically, empirical research has expanded, services are provided in more inclusive settings, partnerships with general early childhood education have grown, and all states are participating in Part C of the Individuals with Disabilities Education Act (IDEA).

In the fall of 1998, DEC and several collaborating university partners were awarded a federal grant to (a) produce a thoroughly supported synthesis of research and experienced-based knowledge about EI/ECSE practices for young children with disabilities birth through 5 and their families; (b) translate and disseminate the synthesis in user-friendly formats for practitioners, families, administrators and training/technical assistance providers; and (c) address the administrative and systems change foundations necessary for long-term adoption of quality practices.

More rigorous methods for producing a set of recommended practices were used in this effort to increase the likelihood of their adoption and implementation at the child, family, and systems levels. These improved methods consisted of: reviewing the research literature for practices that result in improved outcomes; conducting focus groups of researchers, parents, practitioners, and administrators to ascertain their beliefs and values about practices that result in improved outcomes; synthesizing these sources of information; producing recommendations for both "direct" services practices (with children and families) and "indirect" practices or supports such as personnel preparation and policy and systems change activities necessary for the implementation of recommended practices with children and families; and conducting a national field-validation of the practices. The methods which produced the latest compilation of DEC Recommended Practices in Early Intervention/Early Childhood Special Education (Sandall, McLean, & Smith, 2000) are summarized in Figure 1., and are described in detail elsewhere (see Smith, McLean, Sandall, Snyder, & Broudy, 2000). The purpose of this article is to describe the literature review process and subsequent analyses of the research literature data-base emphasizing the research trends between 1990 and 1998.

Methods and Procedures

The procedures used to compile the recommended practices were accomplished in three phases. Phase 1 involved identifying recommended practices through focus groups and a comprehensive literature review. In Phase 2, practices developed in the focus groups were synthesized with practices generated from the literature review. Phase 3 involved a field-validation of the synthesized practices. This manuscript focuses on the literature review associated with Phase 1.

Overall, the project employed a mixed-method design with an emphasis on integrative approaches. From the beginning, a management team of eight researchers was established to ensure that all decisions were subjected to expert review and represented a consensus of opinion. The management team consisted of four project investigators, a strand liaison/methodology consultant, and three other methodology consultants representing expertise in qualitative, single-subject, and group quantitative designs.

The management team determined the categories of practice (strands) to be used for the purposes of grouping and organizing the information from the literature review. The seven strands of recommended practices were: five direct services--assessment, child-focused practices, family-based practices, interdisciplinary models, technology applications; and two indirect supports--personnel preparation, and policies, procedures and systems change.

Research published in peer-reviewed professional journals from 1990 through 1998 was included in the literature review. Forty-eight journals relevant to the field of EI/ECSE were selected and reviewed (see Table 1. for journals and number of articles in each). The tables of contents and abstracts of articles in the 48 journals from 1990 to 1998 were reviewed by project staff to determine if the article met the criteria for inclusion in the study. The criteria were that the article (a) must be an original research report and (b) involved children with disabilities, birth through 5, families of children with disabilities birth through 5, personnel who serve them, or policies and systems change procedures that support effective practice with this population. Each article that met these criteria was analyzed for major aspects of research design and results. Analysis of the articles was accomplished by having individual coders read articles and complete two coding forms that were developed by the project investigators and methodology consultants.

A generic coding form (Form A) was used uniformly across all articles. This form was designed to record the following information (see Appendix A for copy of form):

- article title, authors, journal, year
- general description of participants (children with disabilities, families of children with disabilities, etc.)
- gender, mean age and ethnicity of participants
- disability of participants and severity level of disability
- educational level of family members

- income level of family members
- setting in which study was conducted

A specialized coding sheet (Form B) designed specifically to highlight additional information about research rigor based on the methodology used in the article was also completed by the coders for each article. Coding forms for group quantitative design, single subject design, descriptive/survey design, qualitative design, and mixed method design were used. The specialized coding forms were developed by the project's methodology consultants to ensure that each article was appropriately reviewed according to the research method used in the article. Example items on the specialized coding forms included: variable identification, research design features, outcome measures, duration of intervention, findings, recommended practice(s) supported by the study, and the strand that the recommended practice reflected (see accompanying articles in this issue for analyses of these data). A main purpose of the specialized coding forms was to help the coder evaluate the scientific rigor of the article and subsequently lead the reviewer to determine recommended practice(s) that was supported by the research evidence.

Forty-two coders were trained to code Form A and one specialized form. Inter-coder agreement of at least 85% was established with a methodology consultant before coders engaged in formal coding. In a similar effort to conduct a review of evidence-based practice in occupational therapy, coding sheets were developed and an inter-coder agreement of 75-86% was reached (see Law, Stewart, Pollock, Letts, Bosch, Westmorland, & Philpot, 2002).

Following training, coders were assigned between 10 and 40 articles to code using both the generic and appropriate specialized form for each assigned article. Twenty-nine additional coders read approximately one third of the articles included in the initial screening (*n* = 360) and independently coded the articles as to the recommended practice(s) and strand placement generated by the first coder. When discrepancies occurred between the two coders related to the recommended practices or the strand placement, the article was reviewed and read by two members of the management team and consensus was reached about the recommended practice and strand placement. This occurred for less than 5% of the articles.

Results/Trends

The number of articles derived from the initial screening was 1,018. The final number of articles included in the review was 835. Articles (183) were excluded by coders if the research conducted did not lead directly to a recommended practice, the article did not meet the original criteria for inclusion in the study, or a coder and a methodology consultant determined that the article did not meet the projects' scientific standards to merit inclusion (e.g., case studies had been incorrectly determined to be single subject design studies). Of the 835 articles coded, 54% (*n*=450) employed a group quantitative design, 22% (*n*=184) used a single subject design, 15% (*n*=121) used descriptive/survey designs, 9% *(n*=74) qualitative designs, and 1% (*n*=6) used mixed methods. Table 2 shows the final number of articles with research findings interpreted by coders as having implications for recommended practices by research method.

The total number of recommended practices derived from the 835 articles reviewed was 1,453. This total number of recommended practices exceeds the number of articles reviewed because according to the coders, some studies generated evidence that produced more than one recommended practice. Table 3 shows the number and percent of articles according to the research methodology employed and the recommended practice strand assigned by the coder. For example, 399 articles supported the Child-Focused strand. One hundred and eighty-seven (47%) of those articles used a group quantitative method, 158 (40%) used a single subject design, 38 (10%) a survey/ descriptive design, 12 (3%) qualitative approaches and 4 (1%) used mixed-method design. Literature support for practices were noted 977 times across the seven strands and across the five different methodologies. This number is higher than the actual number of articles (835) because some articles contained more than one practice and at the same time supported two or more strands in the judgment of the coders. Further review of Table 3 shows that: (a) a disparity exists in the amount of empirical research that supports the various practice strands and, (b) regardless of practice strand, group quantitative methods were the predominant research method employed during 1990-1998 in this EI/ECSE research.

Table 4 displays the study methods employed by articles by year. For instance, group quantitative methods were used in 41 (54.7%) of the 1990 articles, while single subject and descriptive/survey designs were used in 14 (18.7%), qualitative in 6 (8.0%) and mixed methods were used in no articles that year. There is a general trend towards increased numbers of articles employing qualitative methodology over the 9 years. The use of single subject methodology increased from 1990 to 1998 but varied with each year. Group quantitative methodology remained the highest percentage method used across all years.

Tables 5 through 8 depict analyses of the Form A data. Table 5 shows the number and percent of articles that reported the disability category of child study participants by year. The "other" category included coder comments such as: "at risk for developmental disability", neurologically impaired", "fetal alcohol syndrome", "spina bifida", "sick preemies". The coders were instructed to code the disability category as defined by the article. Therefore, there were categories or subcategories that were not on the coding sheet. The coders coded these under "other" rather than make an interpretation.

Table 6 shows the number and percent of articles reporting the level of severity of disability of child study participants by year. These data show that on average 53%-73% of articles report the severity of disability with the percent declining over time from 73% in 1990 to 55% in 1998.

Table 7 shows the number and percent of articles reporting the study setting. For the study setting variable, no explicit definitions were offered to coders. Instructions were to code what the author(s) reported as the setting of the study. The setting options for coders on Form A were: home, hospital/clinic, inclusive/integrated classroom, segregated classroom, or other. Initially the "other" category contained nearly 40% of the responses. Two project staff reviewed the entries in the "other" category and agreed to (a) distinguish "survey/interview" (15.8%), and "not clear" entries (2.4%); (b) add "separate" to the segregated classroom category for entries that described settings that are segregated but not a classroom ("speech lab", "OT room", etc.); (c) create a new category of "experimental settings/separate from peers" for entries that described the study setting as "experimental setting", "quiet room", etc.; and, (d) add entries related to "community" to the "inclusive/integrated" category. Table 7 shows that nearly half of the research settings in this EI/ECSE literature between 1990-1998 were home or hospital/clinic. Less than 20% of studies were conducted in inclusive/integrated classrooms or community settings.

Table 8 reports the number and percent of articles by year that reported income level and education level of families in the study. There do not appear to be any trends in these data. Income level is reported between 19-26% of the time and education level between 20-30% of the time in the EI/ECSE literature included in this effort.

Discussion and Recommendations for Future Efforts

This article describes the literature review activities undertaken to contribute to the development of recommended practices in the field of early intervention/early childhood special education. The literature review consisted of articles from 48 peer-reviewed journals that reported research findings related to children with disabilities birth through 5 years, their families, those who work with them, or program policies. The data show which scientific method has been employed to study particular strands and specific practices. These data present the most comprehensive and systematic review of the EI/ECSE research literature to date about which topics and practices have been empirically studied and with which methodologies.

Although this study is the most comprehensive of its kind to date, there are several limitations to the data. First, the criteria for selecting articles to be included in the review was limited to the 48 peer reviewed journals chosen by the management team and the strand chairs. That is, books, chapters, and conference proceedings were not included in this review. Second, studies selected for coding were based on the judgments of two investigators who read abstracts in the 48 journals over the 9 years. Third, due to resource limitations, the coding of all articles was completed by volunteers. However, inter-coder reliability of at least 85% was established with all coders prior to article coding and inter-coder agreement checks for recommended practices and strand placement were completed for 1/3 of the coded articles.

There are several important implications of the study. First, the EI/ECSE knowledge base is founded on a wealth of research. In less than 10 years, over 1000 peer reviewed articles have been published with over 3/4 of them containing implications for practice. However, most journals in the field are not reporting significant numbers of empirical studies as defined in this project related to children with disabilities birth through five. Only about 25% of the journals reported 20 or more empirical studies related to this population over the 9 years reviewed. Finally, it is evident that the field of EI/ECSE has benefited from the rich array of research methods available to study particular questions.

The analyses of the literature base reveals several possible directions for the field. First, future studies would benefit from clarifying study participants, their disability, the severity of the disability, ethnicity and any other characteristics that may impact on the usefulness and replicability of research findings. Journals might suggest standard classifications such as the IDEA definitions of disability, categories of severity of disability, and categories of study settings. Second, where it may be germane to replicability of results, clarity of family and service provider characteristics should be described. Finally, there are areas of practice that have less empirical research support than others, including interdisciplinary models, technology applications and personnel preparation.

The authors offer several recommendations for future similar efforts to summarize the research base in EI/ECSE. Given the impetus to be evidence-based, these recommendations may lead to a more efficient method of review and an improved synthesis of the data-base. First, we recommend a review of the literature take place at least every 5 years. This might reduce the number of articles that need to be reviewed and coded. Second, such a review requires adequate resources. The efforts described in this paper are due to the many volunteer coders in the field. It is unlikely that this volunteer resource can be tapped indefinitely! Third, coding forms should include more standardization of terms and few open-ended entry options to improve clarity and consistency and reduce interpretation errors.

This is the first large-scale effort to summarize the literature base in EI/ECSE across all research methods. Such efforts are important to continue so that researchers can improve methods and reporting of settings, variables, and findings; scientific journals can endeavor to encourage more precision in studies and manuscripts; and funders and researchers can be evidence-based in identifying gaps or areas needing further attention in the on-going quest to identify which services and supports are most effective for which children, families, or the personnel who serve them.

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Figure 1. Data collection, analysis, and synthesis of recommendations from data sources

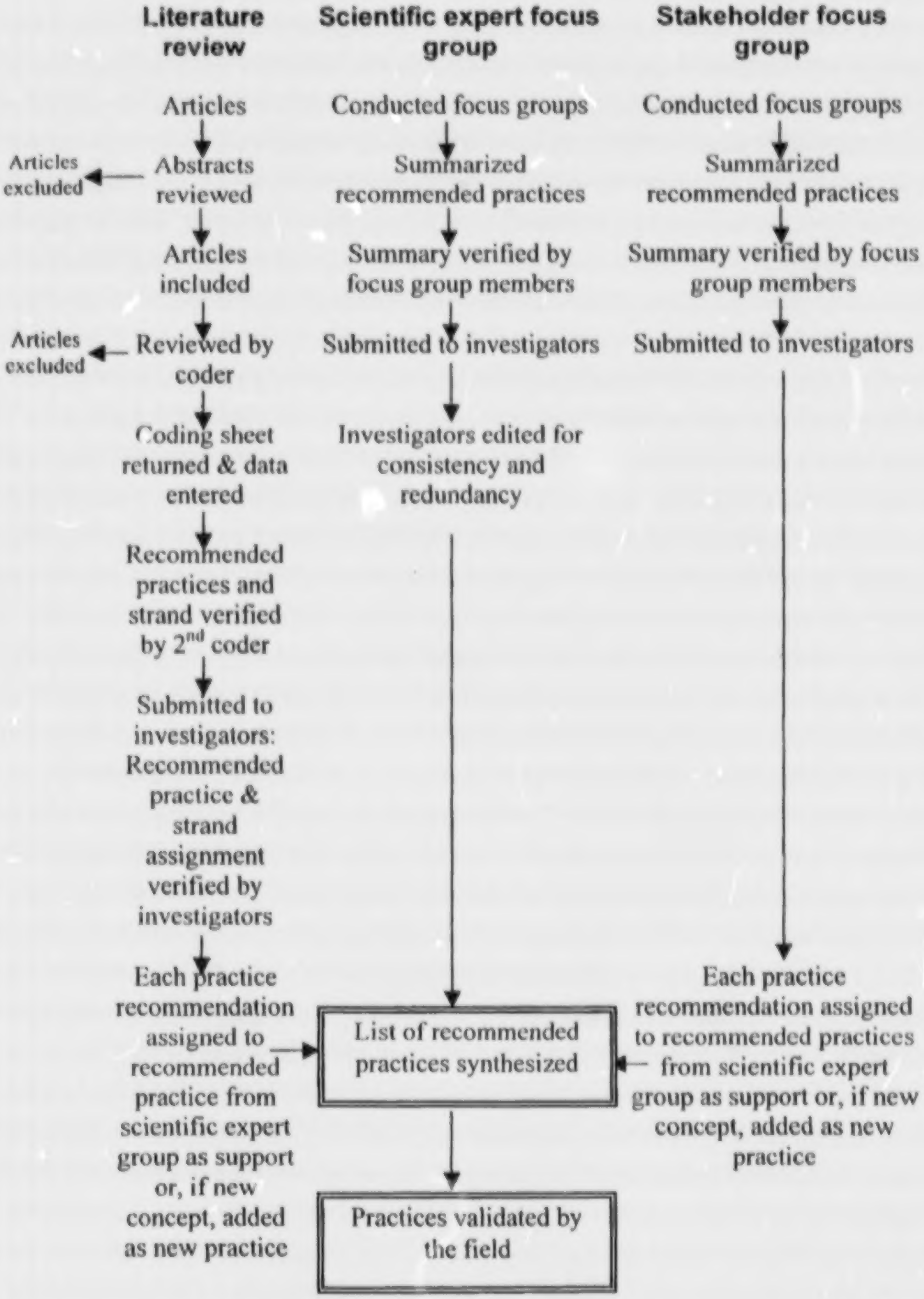
Literature review
Scientific expert focus group
Stakeholder focus group
Articles
Conducted focus groups
Conducted focus groups
Articles excluded
Abstracts reviewed
Summarized recommended practices
Summarized recommended practices
Articles included
Summary verified by focus group members
Summary verified by focus group members
Articles excluded
Reviewed by coder
Submitted to investigators
Submitted to investigators
Coding sheet returned & data entered
Investigators edited for consistency and redundancy
Recommended practices and strand verified by 2nd coder
Submitted to investigators: Recommended practice & strand assignment verified by investigators
Each practice recommendation assigned to recommended practice from scientific expert group as support or, if new concept, added as new practice
List of recommended practices synthesized
Each practice recommendation assigned to recommended practices from scientific expert group as support or, if new concept, added as new practice
Practices validated by the field

Table 1

Number of Articles in Each Peer-Reviewed Journal Included in DEC Research Synthesis

Journal	Number of Articles
American Journal of Occupational Therapy	*32*
American Journal on Mental Retardation	*50*
Archives of Physical Medicine and Rehabilitation	2
Augmentative and Alternative Communication	15
Behavior Modification	11
Behavior Therapy	4
Behavioral Disorders	1
Child Development	6
Child: Care, Health and Development	13
Developmental Medicine and Child Neurology	*40*
Developmental Psychology	5
Diagnostique	6
Early Childhood Research Quarterly	11
Early Education and Development	*21*
Education and Training in Mental Retardation and Developmental Disabilities	18
Education and Treatment of Children	16
Exceptional Children	*47*

Exceptionality	3
Family Relations	13
Infants and Young Children	12
Infant-Toddler Intervention	*45*
Journal of Abnormal Child Psychology	8
Journal of Applied Behavior Analysis	*55*
Journal of Applied Developmental Psychology	13
Journal of Behavioral Education	11
Journal of Communication Disorders	1
Journal of Early Intervention	*102*
Journal of Emotional and Behavioral Disorders	7
Journal of Marriage and Family	0
Journal of Pediatric Nursing	13
Journal of Pediatric Psychology	7
Journal of Special Education	5
Journal of Special Education Technology	0
Journal of Speech, Language, and Hearing Research	*26*
Journal of The Association for Persons with Severe Handicaps	*32*
Journal of Visual Impairment & Blindness	18
Language, Speech and Hearing Services in Schools	18
Mental Retardation	*22*
Merrill-Palmer Quarterly	0
Neonatal Network	9

Occupational Therapy Journal of Research	6
Pediatric Physical Therapy	9
Pediatrics	7
Physical & Occupational Therapy in Pediatrics	12
Physical Therapy	2
Teacher Education and Special Education	1
Topics in Early Childhood Special Education	*73*
Volta Review	7

Note: Journals in *italics* designate those that contributed 20 or more articles to the review.

Table 2

Number and Percent of Articles Interpreted By Coders as Having at Least One Recommended Practice by Method

Method	N (%)
Group Quantitative	450 (54%)
Single Subject	184 (22%)
Descriptive / Survey	121 (15%)
Qualitative	74 (9%)
Mixed Method *	6 (1%)
Total	835 (100%)

* Mixed method = some combination of group quantitative, qualitative, descriptive / survey and single subject methods

Table 3

Number and Percent of Articles by Research Method Employed and Recommended Practices Strand Placement

Method	Strand						
	Child-Focused	Family-Based	Polices Procedures, and Systems Change	Assessment	Personnel Preparation	Technology Applications	Interdisciplinary Models
Group Quantitative	187 (47%)	145 (65%)	50 (47%)	77 (74%)	27 (33%)	13 (41%)	18 (60%)
Single Subject	158 (40%)	21 (9%)	2 (2%)	20 (19%)	9 (11%)	6 (19%)	2 (7%)
Descriptive / Survey	38 (10%)	30 (13%)	30 (28%)	7 (7%)	23(28%)	11 (34%)	3 (10%)
Qualitative	12 (3%)	24 (11%)	22 (21%)	0 (0%)	22 (27%)	2 (6%)	7 (23%)
Mixed Method *	4 (1%)	3 (1%)	2 (2%)	0 (0%)	2 (2%)	0 (0%)	0 (0%)
Total **	399	223	106	104	83	32	30

* Mixed method = some combination of group quantitative, qualitative, descriptive/survey and single subject methods

** Articles could support more than one strand, thus total exceeds number of articles reviewed (835)

Table 4

Number of Articles by Method and Publication Year

Method	Year								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
Group Quantitative	41	43	40	60	62	51	53	67	33
	54.7%	51.8%	48.8%	53.1%	55.9%	52.6%	55.2%	66.3%	42.9%
Single Subject	14	13	23	33	27	21	20	13	20
	18.7%	15.7%	28.1%	29.2%	24.3%	21.7%	20.8%	12.9%	26.0%
Descriptive / Survey	14	22	14	16	15	13	10	6	11
	18.7%	26.5%	17.1%	14.2%	13.5%	13.4%	10.4%	5.9%	14.3%
Qualitative	6	5	4	4	7	9	13	14	12
	8.0%	6.0%	4.9%	3.5%	6.3%	9.3%	13.5%	13.9%	15.6%
Mixed Methods *	0	0	1	0	0	3	0	1	1
			1.2%			3.1%		1.0%	1.3%
Total	75	83	82	113	111	97	96	101	77

* Mixed method = some combination of group quantitative, qualitative, descriptive/survey and single subject methods

Table 5

Number and Percent of Articles Reporting Disability Categories of Child Study Participants by Year

Disability Category	Year								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
Autism	6 5.1%	15 12.8%	10 7.7%	8 4.9%	15 8.9%	9 6.1%	8 5.6%	13 7.3%	15 15.3%
Cerebral Palsy	14 11.9%	8 6.8%	13 10.0%	16 9.9%	13 7.7%	16 10.9%	12 8.4%	16 9.0%	6 6.1%
Developmental Delay	15 12.7%	15 12.8%	20 15.4%	36 22.2%	23 13.7%	27 18.4%	24 16.8%	31 17.4%	22 22.4%
Developmental Disability	5 4.2%	7 6.0%	9 6.9%	10 6.2%	9 5.4%	8 5.4%	10 7.0%	11 6.2%	8 8.2%
Down Syndrome	9 7.6%	13 11.1%	14 10.8%	15 9.3%	21 12.5%	20 13.6%	16 11.2%	16 9.0%	7 7.1%
Emotional/ Behavioral Disorder	4 3.4%	5 4.3%	5 3.8%	6 3.7%	9 5.4%	2 1.4%	5 3.5%	10 5.6%	4 4.1%
Hearing Impairment/ Deaf	5 4.2%	2 1.7%	6 4.6%	11 6.8%	8 4.8%	7 4.8%	10 7.0%	14 7.9%	5 5.1%
Mental	18	15	14	15	16	13	16	17	8

Retardation	15.3%	12.8%	10.8%	9.3%	9.5%	8.8%	11.2%	9.6%	8.2%
Speech/ Language Impairment	9 7.6%	3 2.6%	10 7.7%	11 6.8%	16 9.5%	11 7.5%	12 8.4%	14 7.9%	4 4.1%
Visual Impairment/ Blindness	5 4.2%	9 7.7%	7 5.4%	6 3.7%	6 3.6%	5 3.4%	5 3.5%	10 5.6%	4 4.1%
Other	28 23.7%	24 20.5%	22 16.9%	27 16.7%	32 19.0%	29 19.7%	25 17.5%	26 14.6%	15 15.3%

Table 6

Number and Percent of Articles Reporting Severity of Disability by Year

	Year								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
Articles Reporting Severity	55	51	48	71	66	51	61	54	42
	73%	61%	59%	63%	59%	53%	64%	53%	55%

Table 7

Number and Percent of Articles Reporting Study Setting Data

Study Setting	Number / Percent of Articles
Home	225 23.4%
Hospital/Clinic	230 23.9%
Inclusive/Integrated Classroom	170 17.7%
Separate or Segregated Classroom	130 13.5%
Experimental Settings/Separate from peers	33 3.4%
Other – Survey/Interview	152 15.8%
Other – Not clear	23 2.4%
Totals	963

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Figure 7 (Alternate)

Number and Percent of Articles Reporting Study Setting Data

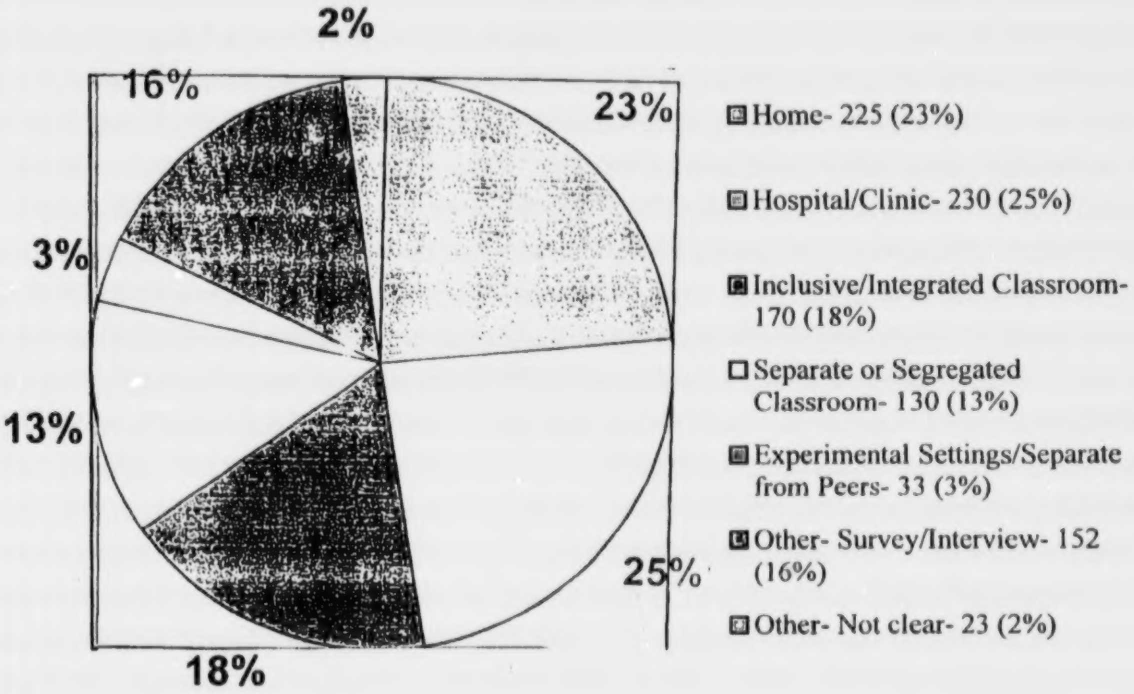

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Table 8

Number and Percent of Articles Reporting Family Income and Education Levels by Year

	Year								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
Articles Reporting Family Income Level	16 21%	16 19%	19 23%	29 26%	22 20%	19 20%	23 24%	22 22%	18 23%
Articles Reporting Family Education Level	20 27%	18 22%	22 27%	29 26%	22 20%	25 26%	34 35%	34 33%	26 34%

Evidence-based Practice in Early Intervention/Early Childhood Special Education: Single Subject Design Research

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Abstract

The purpose of this study was to examine the strength of scientific evidence from single subject research that underlies the DEC Recommended Practices. From the 1991 to 1998 research literature, 184 studies met the inclusionary criteria for this review. In general, the literature provided positive, and in some cases very strong, scientific evidence for the effectiveness of practices from the Child-Focused Strand of the DEC Recommended Practices. Researchers used multiple baseline, multiple probe, alternating treatment, and a combination of designs most frequently. Treatment effects were replicated an average of 5.5 times per study, and treatments appeared to be implemented with a high degree of fidelity. Researchers less often provided evidence for maintenance, generalization, and social validity of treatments. Recommendations for future research are offered.

Evidence-based Practice in Early Intervention/Early Childhood Special Education: Single Subject Design Research

In the field of general education and in special education, great emphasis has been placed on basing educational practice on scientific evidence (Carnine, 1995; Shavelson & Towne, 2002). In the sub-discipline of early intervention/early childhood special education (EI/ECSE), such an approach is also critically important (Guralnick, 1999). Yet, the synthesis of scientific evidence that supports educational and early intervention practices may be limited by a somewhat constrained definition of "science". For many years, research employing single subject experimental designs has made substantial contributions to the scientific evidence underlying effective EI/ECSE practice (Patrick, Mozzoni, & Patrick, 2000; Strain et al., 1992). However, in attempts to synthesize the scientific literature on EI/ECSE, single subject research methodology has often been omitted (Casto & Mastropieri, 1986; Strain & Smith, 1986).

Perhaps because the roots of single subject research methodology are in applied behavior analysis (Baer, Wolf, & Risley, 1968), clinical psychology (Kazdin, 1975), and special education (Haring & Lovitt (1967), single subject research rarely appears in the general education literature. In fact, in a report of a recent committee convened by the National Academy of Sciences (NAS) to review the status of scientific research in education and make recommendations for future research, single subject methodology was never mentioned (Shavelson & Towne, 2002). However, rigorous single subject methodology (Kazdin, 1982; Tawney & Gast, 1983; Wolery & Dunlap, 2001), certainly meets the principles of scientific research established by the NAS committee, which were: a) conducting an empirical investigation, b) linking findings to a theory of practice, c) using methods that permit direct investigation, d) providing a coherent chain of reasoning, and e) replicating and generalizing across studies.

In the related discipline of clinical psychology, single subject design research does appear in the literature. Division 12 of the American Psychological Association established criteria for determining the empirical evidence that supported practice in psychotherapy and clinical psychology (Lonigan, Elbert, & Johnson, 1998) and included criteria for single subject research. Practices could be judged "well-established" if a large series of single-case designs (n>9) used good experimental design, compared the intervention to another treatment or condition, had a treatment manual, and described participants clearly. A practice could be classified as "Probably Efficacious" if a smaller set of studies (n>3) met the criteria just described.

The issue of rigorous experimental methodology is important in determining the degree to which practices have a scientific basis. In single subject methodology, a number of features represent a rigorous application of the methodology. These include a) building evidence for effectiveness through within subject or between subject replications of a treatment effect that demonstrates improvement in children behavior in the desired direction (Wolery & Dunlap, 2001); b) assessing the reliable application of the treatment, which is referred to as fidelity, integrity or implementation of treatment (Gresham, Gansel, & Kurtz, 1993; Peterson, Homer, & Wonderlich, 1982; LeLaurin & Wolery & 1992); c) systematic and quantitative assessment of the dependent variable (Kazdin, 1977); d) maintenance of treatment effects across time (Kazdin, 1982); and d) generalization of treatment effects across settings, persons, and/or behaviors (Stokes & Baer, 1977). In addition, high quality, rigorous single subject methodology includes judgments of the social validity (i.e., the social importance) of the treatment (Wolf, 1978; Schwartz & Baer, 1991).

Given that single subject research informs the practice of EI/ECSE (Strain et al., 1992; Patrick et al., 2000), then any attempt to summarize the scientific evidence that underlies practice in EI/ECSE must include single subject design research. Like all paradigms of scientific inquiry, single subject design studies vary in their rigor and sophistication, so simply documenting the number of studies that support a specific practice provides little information about the quality or rigorous nature of the scientific support. In the current study, the aim was to provide a strength-of-evidence analysis in which number of replications and study rigor could be summarized to yield conclusions about a) the degree of support for individual EI/ECSE practices and b) the quality of single subject design research in EI/ECSE. Such an analysis would also provide information about gaps that may exist in the empirical support for practice and/or the quality of the research methodology employed, which in turn could inform a future research agenda.

Methods

To summarize the research on recommended practices in EI/ECSE, a task force of the Division for Early Childhood accessed research published in 48 peer-reviewed journals between the years of 1991 and 1998. This process is described in detail in Smith et al. (in press). To be included in the current review, articles had to contain original research and involve children with disabilities from birth to 5 and/or their families, personnel working with children with disabilities and/or their families, or policies or systems change procedures. Studies had to include quantitative or qualitative data that demonstrated the effectiveness of a practice or set of practices, and were excluded if they primarily were psychometric evaluations of assessments, descriptive case studies involving only a single individual or program, or descriptions of children's development or family functioning in the absence of a specific intervention or practice being implemented. Studies were categorized as group design, single subject design, or qualitative design. In this paper, only information on single subject design will be presented. The criteria for inclusion in the single subject design data base were that the study had to have at least one demonstration of experimental control of the independent variable and that it employed a standard single subject design methodology (Tawney & Gast, 1983). Thus, A-B designs that involved only a baseline and implementation of the treatment without a withdrawal of treatment phase, replication across settings, behaviors, or participants were excluded. In the initial identification of studies, 208 articles were identified. Of this number, 184 meet the criteria for inclusion in the single subject design database.

Coding Procedures

All single subject research studies were coded using Forms A and B. Form A provided a generic description of the articles [see Smith et al. (2002) for a description of Form A] and was used uniformly across all articles in the Recommended Practices database. Form B-Single Subject Specialized Coding Sheet was used for all single subject design articles. This form was developed by the co-authors of this study, pilot tested with a sample of single subject design studies, and reviewed by researchers knowledgeable about single subject design methodology. In the Form B evaluation, coders rated descriptive parameters of the single subject methodology employed and the results. These parameters included the type of single subject design, whether the study took place in a group/integrated setting or in an individual/therapeutic and separate setting, whether the agent of intervention was an adult or peer, how many replications of the intervention effect occurred, and a narrative description of the dependent variable(s) and independent variable(s). Eight additional items were designed to produce an index of outcome believability by rating each study on design features that indicated high quality, rigorous single subject studies. The eight quality design features and their associated rating schemes were as follows:

A) Independent variable assessment – Yes =1; No = 0

B) If yes, fidelity of intervention was – High = 2; Medium = 1; Low = 0

C) Evidence of improvement over time – Yes = 1; No = 0

D) Evidence of intervention maintenance across time – Yes = 1; No = 0

E) Evidence of intervention generalization – Yes = 1; No = 0

F) Social validity assessments included – Yes = 1; No = 0

G) Outcome acceptability (consumer satisfaction included) – Yes = 1; No = 0

In addition, after these ratings were completed, the coders summarized the practice(s) that was/were supported by the data presented in the article. This information was then used to inform the development of the DEC Recommended Practice Indicators (Smith, McLean, Sandall, Snyder, & Broudy, 2000).

Coders of Single Subject Design Articles

The two co-authors of this study recruited 16 individuals with direct experience conducting and reviewing single subject research to serve as coders for this study. Prior to reviewing any articles for this analysis, coders read the rating forms and practiced coding a standard article. In individual telephone calls, the co-authors discussed the rating items and compared the coder's rating with the standard rating established by the co-authors. Discrepancies were discussed and resolved. Coders then rated a second article, which was sent to the co-authors. To be included as a coder, potential raters had to meet an 85% inter-rater agreement criterion (between the coder and one co-author). After meeting this criterion, coders were assigned 10-20 articles. Inter-rater agreement was then conducted on 33% of the single subject design articles. Inter-rater agreement exceeded 85% across item ratings

Results

The initial review of the literature revealed a total of 215 single subject design articles published during the 1990s that provided support for recommended practices in early intervention/early childhood special education (See Table 1). The total number of studies exceeded the number of articles noted previously because some articles contained more than one study. All of the studies were associated with DEC Recommended Practices in the Child-Focused Intervention Strand. The average number of studies associated with a specific recommended practice was 9.97, with a range from one study supporting C26-Intensity of Instruction to 32 studies supporting C24-Prompting and Prompt Fading. The greatest number of single subject design studies supporting practices were for C24-Prompting and Prompt Fading, C27-Functional Assessment and PBS, C21-Consequences Support Play, Engagement, Learning, C22-Naturalistic Teaching Approaches, C23-Peer-mediated Strategies, and C12-Practices Individualized.

Designs

Researchers employed all the major single subject designs in their studies of early intervention/early childhood practices. The frequency of each type of design appears in Figure 1. The design that researchers employed most frequently was the multiple baseline design. The multiple probe design, a variation on the multiple baseline design, and the alternating treatment design, most often used to compare treatments, occurred relatively frequently. The two designs that required a withdrawal of treatment or conditions which led to a reversal of treatment effects were used less often. Both types of designs, however, still appeared in over 20 studies. Also, researchers used variations on the standard designs (i.e., the Other category) frequently to address specific questions. Last, the simultaneous treatment design, a design having very specific experimental requirements, was only used once in this data set.

Independent Variable

Two important features of single subject designs are related to treatment fidelity. Fidelity is assessed by measuring the degree to which the independent variable is implemented as planned. In the single subject design studies from this database, researchers assessed the independent variable in 50% of the studies. When the independent variable was assessed, the fidelity of treatment (i.e., implementation) was rated as high (2), medium (1), or low (0). The average ratings for studies grouped by recommended practices appear in Table 1. The average fidelity of treatment rating for the entire sample was 1.79, indicating an overall high implementation of intervention, when this variable was assessed.

Experimental Control and Replications

The feature of single subject designs that makes them experimental is the demonstration of a functional relationship between the independent and dependent variable (Baer, Wolf, & Risley, 1968). This functional relationship demonstrates experimental control through within-subject and between-subject replications of treatment contrasts (i.e., a change in the dependent variable occurs when treatment is implemented after a baseline condition). Two types of data address this issue of experimental control. Raters identified the number of replications of treatment conditions (i.e., implementation of treatment after a baseline) that occurred in each study. Across studies, the mean number of replications was 5.5, with a range from 2.25 to 14.5 replications across individual practices. Improvement in children's performances within phases occurred in nearly 78% of the studies. The means ranged from 50% for the two studies associated with C13-Meaningful Outcomes to 100% for the two studies associated with C15-Functional Outcomes, the two studies associated with C20-Normalized Interventions, and the two studies associated with C26-Intensity of Instruction. Together, these data indicated that experimental control was tested often through multiple replications and yielded a relatively high degree of success.

Maintenance and Generalization

The assessment of the durability, continuity, and transfer of treatment effects were assessed through maintenance of treatment effects (i.e., changes in behavior continue after intervention has ended) and generalization (i.e., behavior changes occur in other settings, with other people, or are reflected in changes in other types of behavior). In this study, raters determined if there was evidence for maintenance or generalization. Unfortunately, we did not differentiate between studies that assessed maintenance and generalization and did not find it and studies that did not assess maintenance and generalization. So, these data are somewhat limited and perhaps conservative in their estimates. Raters found that 39% of the studies provided evidence of maintenance.

This figure ranged from 0% for C2-Social Ecology Structured, C11-Foster Social Relationships, and C26-Intensity of Instruction to 67% for C25-Embedded Instruction and 60% for C12-Individualized Interventions and C15-Functional Outcomes.

The average percentage of studies providing evidence of generalization was 43.89%, again with a large range. A mean of 0% occurred for C14-Data-Based Decision Making, C20-Normalized Interventions, and C26-Intensity of Instruction. In contrast, 80% of the studies associated with C15-Functional Outcomes, 68% of the studies associated with C22-Naturalistic Interventions, and 67% of the studies associated with C25-Embedded Intervention provided evidence for generalization. In general, authors tended to provide more evidence for generalization than for maintenance.

Social Validity

Social validity is a judgment of the social importance of intervention goals, procedures, and effects (Wolf, 1978). In this analysis, raters assessed whether researchers measured the social validity of their treatment procedures (i.e., acceptability) or outcomes. The means for both types of social validity were quite low. The average across groups of studies was 15.39% for treatment acceptability. Eight recommended practices had no studies reporting treatment acceptability. For two Recommended Practices with small numbers of studies (C11-Foster Social Relationships and C26-Intensity of Instruction), all (100%) studies reported treatment acceptability.

The judgment of the social importance of the effects of interventions is a second form of social validity. The mean percentage (27.19%) was slight higher for this measure than for treatment acceptability. Three groups of recommended practices also reported no measures of outcome social validity, C8-Variety of Intervention, C9-Natural Environment, and C20-Normalized Interventions. Like the Treatment Acceptability measurement, all of the studies associated with C11-Foster Social Relationships and C26-Intensity of Instruction reported Outcome Social Validity, as did 67% of the studies associated with C2-Social Ecology.

Discussion

The purpose of this study was to examine the scientific evidence for the effectiveness of practices in EI/ECSE research provided by single subject design research. A second purpose was to examine the quality of the research methodology of the studies that supported EI/ECSE practices. As noted previously, Division 12 of APA established single subject research criteria for evidence-based practice, which could be used to determine empirical support for EI/ECSE practices. Six of the DEC Recommended Practices in the Child Focused Strand met the number of studies criterion (>9) for "well established" efficacious practice (C12-

Individualized Intervention, C21-Consequences Support Play/Engagement/Learning, C22-Naturalistic Teaching Approaches, C23-Peer-mediated strategies, C24-Prompting and Fading, C27-Functional Assessment and Positive Behavior Support). From this body of research, teachers may have confidence that when these practices are appropriately and consistently implemented with children, they are highly likely to produce positive effects in the settings in which they are applied.

A second set of practices met the APA Division 12 frequency of studies criterion (>3) for being "probably efficacious". These practices included: planning and organizing the C1-Physical Ecology and C2-Social Ecology of the classroom to promote learning, C3- Planning Routines and Transitions Within the Class, C8-Teaching Skills in Different Activities, C9-Teaching Skills in Natural Environments, C14-Using Data to Make Decisions, C15-Selecting Functional Outcomes, C16-Responding Contingently to Children's Behavior, C17-Using Different Teaching Approaches for Different Phases of Learning, C18-Involving Multiple Individuals and Materials in Teaching, C19-Planning Instruction in which Children Apply the Skills, and C25-Embedding Instruction in Ongoing Activities in the Classroom. From the single subject research literature, teachers can have some confidence that these instructional practices will yield positive effects when implemented consistently, although the practices are not as strongly supported by the literature as are those mentioned previously.

A third set of practices received limited support from the single subject design literature (i.e., number of studies ≤3). These included C11-Fostering Social Relationships, C13-Meaningful Outcomes, C20-Using Normalized Intervention Approaches, and C26-Intensity of Intervention. In addition, several strategies were not supported by the single subject design literature: C4-Structuring Play Routines, C5-Promoting Cultural and Linguistic Awareness, C6-Meeting Quality Standards, C7-Providing Safe Environments, and C10-Promoting Child-Initiated Engagement. These practices are valued within the field and probably draw their support from group design and qualitative design research studies. Given that one aim of this study was to identify gaps in the single subject design literature, certainly a direction for future research could be to employ single subject methodology to further substantiate the effectiveness of these practices.

Several features of the data presented in this study indicate strong general support for the DEC Child Focused Recommended Practices. On the average, the treatment effect was replicated 5.5 times within a study. The experimental nature of single subject research is based on multiple replications of the treatment effects, which were occurring in this set of studies. Although on the average only half of the studies assessed fidelity of treatment, when it was assessed the treatments appeared to have been implemented with a high degree of fidelity (i.e., a mean rating of

1.64 out of 2.0). Plus, in the substantial majority of studies, improvement in students' performance occurred across phases.

Evidence for maintenance and generalization of treatment effects were less compelling. On the average, only 39% of the studies provided evidence for the maintenance of treatment effects after the intervention ended. Although the range extended up to 67% for some practices, in the majority of studies researchers omitted the important measurement or documentation of maintenance. Likewise, only about 44% of the studies provided evidence of generalization of treatment effects. Although this percentage ranged higher for some practices (e.g., 68% for C22-Naturalistic Teaching Strategies) and the average percentage was higher than for maintenance, the majority of studies still did not provide evidence for generalization. Unfortunately, because of the coding system used, these data do not discern between studies in which no maintenance or generalization data were collected and studies in which maintenance and generalization data were collected but treatment effects did not maintain or generalize. A clear recommendation for the future use of single subject research in EI/ECSE is that investigators incorporate into their study procedures plans to assess maintenance and generalization as well as instructional procedures to support it.

Social validity is another dimension of single subject methodology that reflects the rigorous nature of the experimental design. In this study, coders documented the assessment and evidence for two forms of social validity: acceptability of treatment procedures and social importance of outcomes. Overall, assessment of both types of social validity occurred in only a moderate percentage of the studies (i.e., 15% and 27% of the studies respectively). Again, a clear recommendation emerging from these data is that researchers employing single case design in EI/ECSE need to be more vigilant in their assessment of the social validity of treatment procedures and outcomes (Schwartz & Baer, 1991).

The analysis of the types of single subject experimental designs indicated that researchers selected multiple baseline designs much more frequently than any other design, with multiple probe designs also being used often. The advantage of multiple baseline designs is that the researcher does not have to withdraw treatment or reverse positive performances for children in order to demonstrate an experimental effect. The ethics of withdrawing treatment, once a practice has produced positive results, is troublesome and may prevent researchers from employing this design. However, it is important to note that multiple baseline/probe designs are not without ethical issues. In some designs, children in the second and third tiers of the multiple baseline may remain in a baseline phase for an extended time. Another type of design employed relatively often was the alternating treatment design, which allows researcher to compare the relative strengths of treatments. This design also does not require a withdrawal of effective treatment, but rather an ongoing comparison of two treatments. We anticipate that both the multiple baseline, multiple probe, and alternating treatment designs will continue to be designs of choice for EI/ECSE researchers in the future.

In conclusion, the single subject design research of the 1990s provides a scientific basis for some of the standard practices in EI/ECSE. The studies reviewed were related specifically to child focused practice. Research employing other methodologies has been used to support practices in other strands as well as provide complementary support for practices in the Child-Focused strand. As a body of research, the quality of the basic design and methodology appeared strong, although evidence for maintenance, generalization, and social validity was lacking and should be a focus for future research.

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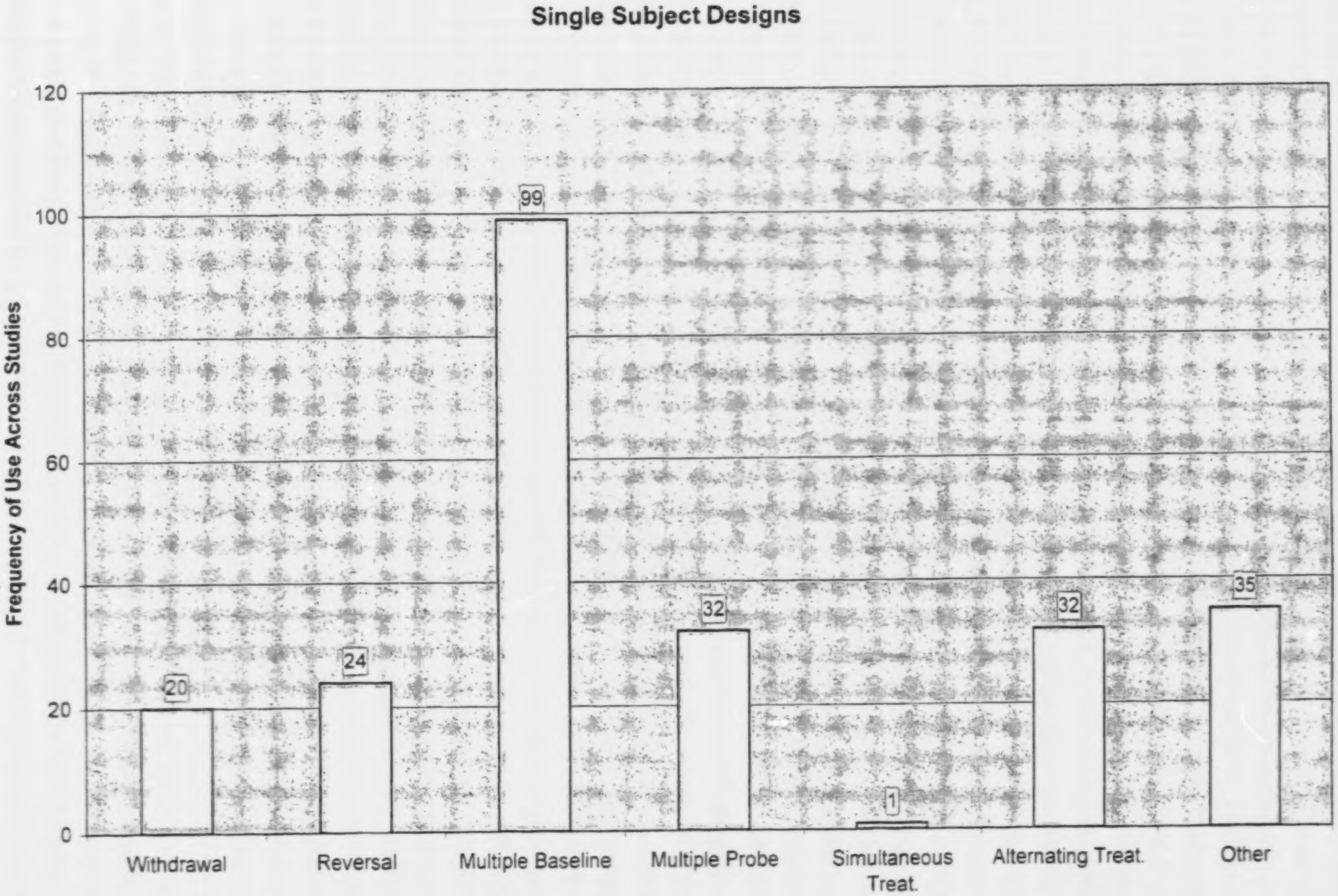
Figure Caption. Frequency of different types of single subject designs



Single Subject Designs

Table 1

Recommended Practices and Features of Single Subject Designs

Recommended Practice	N	Replications	Independent Variable	Fidelity of Treatment	Improvement Across Phases	Mainten-ance	Generaliza-tion	Social Validity: Acceptability	Social Validity Outcomes
C1-Physical Space Organized	8	5.6	50%	1.5	87.50%	50%	62.60%	0%	37.50%
C2-Social Ecology Structured	3	5	67%	1.5	67%	0%	67%	33%	67%
C3-Routines and Transition Structured	6	5	83%	1.6	67%	33%	50%	0%	50%
C8-Multiple Settings and Activities	4	2.25	50%	2	50%	50%	25%	0%	0%
C9-Natural Environments	4	3.75	75%	2	75%	50%	50%	0%	0%
C11-Foster Social Relationship	2	3.5	50%	1	50%	0%	50%	100%	100%
C12-Individualized Intervention	15	6.2	50%	2	67%	60%	47%	20%	20%
C13 Meaningful Outcomes	2	6.5	50%	2	50%	0%	50%	50%	50%
C14-Data-based Decision Making	5	5.8	80%	0.75	80%	20%	0%	20%	40%
C15-Functional Outcomes	5	5.2	80%	2	100%	60%	80%	0%	20%
C16-Child Behavior Responded to Contingently	3	2.33	67%	2	67%	33%	33%	33%	33%
C17-Learning Phases Require Different Practices	8	7.37	50%	2	75%	37.50%	37.50%	0%	12.50%
C18-Practices Used Across People and Settings	6	7	33%	1.5	67%	50%	16.67%	0%	16.67%
C19-Instructional planning based on application of skills	7	2.57	71%	1	71%	43%	57%	43%	43%

C20-Normalized Interventions	2	14.5	0%	nd	100%	50%	0%	0%	0%
C21-Consequences Support Play/Engagement/Learning	27	6.19	41%	2	82%	52%	41%	19%	25.90%
C22-Naturalistic Teaching Approaches	24	4.24	64%	1.93	84%	36%	68%	12%	28%
C23-Peer-mediated Strategies	15	5.6	53%	2	87%	20%	53%	27%	13%
C24-Prompting and Prompt Fading	32	5.1	47%	1.86	75%	38%	53%	12.50%	12.50%
C25-Embedded Instruction	6	3.67	50%	2	67%	67%	67%	16%	16%
C26-Intensity of Instruction	1	8	100%	0	100%	0%	0%	100%	100%
C27-Functional Assessment and PBS	30	6.7	23%	1.71	83%	30%	10%	10%	47%
Mean[1]	9.77	5.5	50%	1.79	77.84%	39%	43.89%	15.35%	27.19%

[1] Weighted means were calculated by multiplying the number of studies (second column) by the design feature (e.g., Fidelity of Treatment rating), summing these calculations, and dividing the total number for each column by the total number of studies (i.e., 215)

Running head: EXAMINATION OF QUANTITATIVE METHODS

Examination of Quantitative Methods Used in Early Intervention Research: Linkages with Recommended Practices

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Abstract

Findings are reported related to the research methods and statistical techniques used in the 450 group quantitative studies examined as part of the literature review portion of the Division for Early Childhood Recommended Practices project. Twelve trained coders used an investigator-developed coding form to analyze studies across seven major dimensions: (a) sampling procedures, (b) variable selection, (c) variable definition, (d) measurement integrity, (e) treatment fidelity, (f) statistical analyses, and (g) magnitude-of-effect reporting. Results suggested that the methodological rigor of the quantitative research used to inform recommended practices was not uniformly convincing and compelling. Implications are offered related to the strength of empirical support for recommended practices and the conduct and reporting of future research.

Examination of Quantitative Methods Used in Early Intervention Research: Linkages with Recommended Practices

Efforts to produce recommended practices involve integration of the "best available" research evidence with knowledge gained through experience. This integration should occur in a context that addresses the social validity of the proposed practices. Peters and Heron (1993) offered a set of five questions that should guide efforts to produce recommended or best practices: (1) Does the practice have a sound theoretical base? (2) Is the methodological integrity of the research convincing and compelling? (3) Is there consensus within the existing literature? (4) Is there evidence that desired outcomes are consistently produced? (5) Is there evidence of social validity? Each of these five questions was considered in the formulation of the Division for Early Childhood (DEC) Recommended Practices and the procedures by which these questions were operationalized is described by Smith, McLean, Sandall, Snyder, and Broudy (2000) and Smith et al. (2002).

The methodological integrity shown in early intervention (EI) research has been complimented and criticized simultaneously over its history. Compliments generally have accrued when the complexity of conducting applied research on complicated issues with low-incidence or heterogeneous populations is considered and the incremental progress related to addressing early intervention efficacy is demonstrated (Guralnick, 1997; Simeonsson, 1985; Strain & Smith, 1986). Criticisms typically have revolved around issues associated with lack of methodological rigor, including poor design, imprecise and insensitive measurement, and inadequate statistical analyses (e.g., Casto & Mastropieri, 1986; Dunst & Rheingrover, 1981; Farran, 1990, 2000).

To date, compliments and criticisms about early intervention research primarily have been associated with published reviews related to whether early intervention is effective for young children with disabilities or those at-risk for disabilities. Several influential researchers have suggested that EI research accumulated over the past 30 years permits moving beyond questions related to whether services and supports should be provided to questions related to which services and supports are most effective for which children and families (e.g., Guralnick, 1997). As the field develops a clearer vision of the types of research that should be conducted (see Wolery & Bailey, 2002) and continues to use best available evidence to formulate recommendations for practice, a review of past methodological approaches and trends may offer constructive implications for the future (cf. Shulman & Margalit, 1985). Further, specific guidelines for reporting research findings have been promulgated recently in the *Journal of Early Intervention* (McWilliam, 2000; Snyder, 2000; Wolery & Dunlap, 2001) and elsewhere (e.g., APA, 2001; Wilkinson & the Task Force on Statistical Inference, 1999). The extent to which research reported in EI-related journals corresponds with these guidelines should be informative for authors, editors, and consumers of research.

The purpose of this article is to present findings related to the research methods and statistical techniques used in the 450 group quantitative studies examined as part of the literature review portion of the DEC Recommended Practices project (see Smith et al., 2002 for additional details about the overall literature review and associated coding procedures). The objectives of this quantitative review were to evaluate the scientific rigor of each study and to help determine recommended practice(s) supported by group quantitative research evidence. To evaluate rigor, we examined sampling procedures, variable selection, variable definitions, measurement integrity, treatment integrity, and statistical analyses employed.

Method

Articles Included in the Review

As described by Smith et al. (2002), empirical research published in 48 peer-reviewed, professional journals relevant to the field of EI from 1990 through 1998 were included in the overall review. Inclusion criteria were that each article (a) be an original research report, and (b) either involve children with disabilities birth through 5, families of children with disabilities birth through age 5, personnel who serve these children and families, or policies or systems change procedures that support effective practice with these groups. Studies not eligible for inclusion were those that reported the development and testing of measurement instruments used in early intervention, normative reports, "*n* of 1" descriptive case studies, and developmental research. Articles included in the group quantitative category for review and subsequent coding had to meet the inclusion criteria described above and, in addition, had to be classified as using one of three experimental designs (pre-experimental, quasi-experimental, true experimental) or as causal-comparative research (Campbell & Stanley, 1966; Gay & Airasian, 2000).

Coders of Quantitative Articles

Members of the DEC Recommended Practices project management team recruited coders. Forty-two individuals who were members of the Division for Early Childhood (DEC) volunteered to be trained and to code articles. Of these 42 individuals, 12 met criteria for serving as quantitative coders because they had established expertise in experimental group design and met or exceeded inter-coder agreement standards established by the project investigators. The majority ($n = 8$) of quantitative coders were members of the DEC Research Committee. Three of the coders were male; nine were female. Eleven coders were employed as faculty in various institutions of higher education throughout the United States and one coder was a doctoral student in early childhood special education.

Coding Forms

Two quantitative methodology consultants from the project management team developed a specialized coding form (Form B-Quantitative) designed to permit recording of variables associated with scientific rigor in quantitative studies. Form B-Quantitative supplemented the generic coding form (Form A), which was used uniformly across all studies included in the literature review (see Smith et al., 2002 for descriptions of Form A). Form B-Quantitative prompted recording of information about types of sampling procedures used, major classes of variables studied, measurement tools used, types of psychometric integrity data reported for study measures, treatment integrity information, types of inferential statistical analyses used to address major study hypotheses, and statistics related to result importance (i.e., magnitude-of-effect indices).

The initial version of Form B-Quantitative contained 55 coding categories. A quantitative methodology consultant and a project investigator piloted the initial form by separately coding five articles which met the inclusion criteria for quantitative group design studies but which were not included in the literature review because they were published before 1990. Form A and Form B-Quantitative were completed for each study. Responses to each of the coding categories were compared across the two coders and inter-coder agreement was evaluated based on the number of agreements/number of agreements plus disagreements. Agreement averaged 87% across the five studies coded (range 81% to 92%). Disagreements were discussed and revisions to Form A and Form B-Quantitative coding forms were made. The final version of Form B-Quantitative contained 53 coding categories. (A copy of this coding form is available from the first author).

Procedures

A project investigator, project coordinator, and graduate student worker identified articles that met inclusion criteria for quantitative group studies. A quantitative methodology consultant subsequently verified the appropriateness of these articles for inclusion in the quantitative review and trained the coders. Training of coders involved review of a quantitative coding training guide developed by the quantitative methodology consultants that (a) described coding categories, (b) provided opportunities to practice coding using short excerpts from published literature, and (c) required coding of an entire article using Form A and Form B-Quantitative. After training, coders were required to code an additional quantitative group design article, which met inclusion criteria but was published before 1990, to establish inter-coder agreement of 85% or greater with an expert standard (i.e., quantitative methodology consultant).

Most coders (n = 8 of 12) achieved inter-coder agreement of 85% or greater after coding two articles (range 86% to 99%). Those coders who did not achieve inter-coder agreement standards after coding two articles were provided additional articles to code until they reached inter-coder agreement of 85% or greater. Inter-coder agreement of greater than 85% was required before a coder was assigned articles to review from the pool of eligible studies.

Following training, coders were assigned between 10 and 40 articles to code using Form A and Form B-Quantitative. Coders were sent copies of each article assigned to them, sufficient copies of Form A and Form B, and information about how to contact an investigator or methodology consultant if questions arose while coding.

Coders were asked to complete coding of their assigned articles within 1 to 3 months. Two coders subsequently were unable to complete coding of all articles assigned to them within established timelines. These articles (n = 78) were re-assigned for coding to a quantitative methodology consultant and to a project investigator who participated in the coder training and reached established inter-coder agreement standards.

Data Analyses

Data from the coding forms were entered into a spreadsheet program (Microsoft Excel™) at the primary research site and later transferred to a cooperating research site for integration into Microsoft Access™ databases. Databases were reviewed for potential errors (e.g., duplicate records, impossible values) and data entry errors were resolved by consulting the coding form, or, if necessary, by review of the research article associated with the coding form. The quantitative database contained 450 records (articles). These records were queried to produce the results described below.

Results

Sampling Procedures

In 47 (10.4%) studies, participants were randomly selected from defined populations. Participants in the remaining 403 studies were samples of convenience. Random assignment to groups occurred in 9.7% (n = 44) of the studies with six of these studies involving a control group (i.e., group that received no intervention). Four studies (0.8%) used both random selection and random assignment procedures. Thirty-eight (8.4%) studies reported use of a control group with or without random assignment to a control condition.

Matching participants on various attribute variables occurred in 106 (23.5%) of the studies. Covariate controls to adjust for non-equivalence of groups were used in 51 (11.3%) of the studies.

Variable Selection

At least one independent or attribute variable was identified in 415 studies. The remaining 35 studies involved one-group, pre-experimental designs in which all participants received the same treatment or were exposed to the same condition. The majority of independent or attribute variables (*n* = 255, 61.4%) selected for study were related to children. Table 1 shows the numbers and representative examples of independent or attribute variables selected for study organized under the seven recommended practices strand categories: child, family, policy/systems, personnel, technology, assessment, and interdisciplinary models.

Coders were asked to list dependent variables for each study and identify associated dependent measures. One dependent variable (DV) was identified in 182 articles, two DVs in 102 articles, three DVs in 84 articles, and four or more DVs in 82 articles.

Variable Definitions

Primary dependent measures reported for the 450 articles were recorded and subsequently categorized into one of four groups: (a) investigator developed, (b) commercially-available, (c) published in research or limited circulation, and (d) measuring devices. Investigator-developed measures were the most frequent (*n* = 242) type of measure used as a primary dependent measure. Table 2 shows the frequency and representative examples of dependent measures in each category.

Measurement Integrity

In 255 (56.6%) studies, information was provided about at least one type of reliability of scores for primary dependent measures. In 37.5% (*n* = 169) of the studies, score reliability estimates were based on data obtained from study samples. At least one validity estimate was reported in 92 (20.4%) of the studies. In 17 (3.7%) studies, score validity estimates were based on data obtained from study samples. Table 3 shows the frequencies associated with the different types of reliability and validity estimates reported for primary dependent measures and the number of these estimates that were based on study sample data.

Measures of inter-observer agreement or inter-observer reliability for primary dependent measures were gathered in 158 (81%) of 195 studies involving observational data collection. The most common agreement/reliability indices used were percent agreement (94 studies), kappa (47 studies), and Pearson product-moment correlation coefficient (12 studies). Intraclass correlation or generalizability coefficients were reported in 12 studies.

Treatment Integrity

Data were provided about the schedule of implementation (e.g., frequency, intensity, duration) for the independent variables or treatment provided in 217 (48.2%) of the studies reviewed. Coders judged that 57 (12.67%) of the 450 studies provided explicit information related to treatment integrity. Examples included training with feedback for those who were responsible for implementation of the independent variable, procedural checklists, and scripts.

Statistical Analyses

Statistical analyses employed in the 450 studies were coded under five broad categories: (a) univariate parametric (e.g., t-tests, ANOVA, multiple regression, Pearson product-moment correlation), (b) univariate nonparametric (e.g., chi-square, Spearman rank correlation, Mann Whitney U), (c) multivariate parametric (e.g., MANOVA, discriminant analysis, canonical correlation analysis), (d) multivariate nonparametric (e.g., logistic regression), and (e) other (e.g., structural equation modeling, hierarchical linear modeling). Table 4 shows the five categories of statistical analyses and the numbers of studies using these techniques per year. Univariate parametric techniques (e.g., t-tests, ANOVA, Pearson product-moment correlation, multiple regression analysis) were the most common class of statistical analyses used across all years included in the review (i.e., 1990 through 1998).

Eighty studies (17.7%) reported magnitude-of-effect indices in association with the primary study hypothesis. Table 5 lists the number and type of magnitude-of-effect indices reported under four major categories: (a) variance-accounted-for, uncorrected; (b) variance-accounted-for, corrected; (c) mean difference; and (d) other.

Discussion

The findings reported in this paper offer a descriptive analysis of the scientific rigor of 450 group quantitative EI research articles published in 48 journals from 1990 through 1998. When linked with efforts to produce recommended practices for the field, the results of the analysis help address questions about whether the methodological integrity of the group quantitative research is convincing and compelling. The findings reported in this paper also offer implications for the conduct of future research and the reporting of research findings.

Design and Sampling Procedures

The majority of research analyzed employed causal-comparative or quasi-experimental designs. These types of designs produce evidence at an individual study level that is less convincing and compelling than true experimental designs, particularly in relation to establishing cause-effect relationships and directly informing a recommended practice. As Kaufman (1990) noted, however, the contribution of research to practice is rarely achieved from a single study, even a true experimental design study. To inform the development of recommended practices, evidence must accumulate across studies and findings from a single study must be synthesized and integrated with knowledge generated from other studies addressing similar questions.

The lack of rigor found in the quantitative designs used across the reviewed articles may not reflect poor science or scientists as much as the reality of conducting field research on complicated questions, often with intact groups (Strain & Smith, 1986). Research in early intervention continues to be primarily field based, where random assignment and establishment of control groups often are difficult to achieve (Heckenlaible-Gotto & Choi, 1993).

Realities associated with conducting field-based research should not be used to excuse the use of quantitative group designs of poor quality or the use of group designs when other methodologies (e.g., qualitative, single case experimental designs) may be more appropriate. Researchers who implement and report group quantitative designs should explicitly acknowledge the internal and external validity threats introduced by less rigorous designs and make clear that evidence produced by these designs is only tentative. The Task Force on Statistical Inference (Wilkinson et al., 1999) admonished, "Make clear at the outset what type of study you are doing. Do not cloak a study in one guise to try to give it the assumed reputation of another."

As noted in the publication *Scientific Research in Education* (National Research Council, 2002, p. 97), research design is one aspect of a larger process of rigorous inquiry and the design of a study does not itself make it scientific. Other findings reported in the present article permit comment about the extent to which broadly defined rigorous inquiry was shown by quantitative group design research in EI and insights about what steps might be taken to increase rigor in future research.

Measurement Integrity

Several measurement-related issues emerged across the reviewed studies. Given the central role of measurement in rigorous scientific inquiry, these issues deserve particular attention. First, only 56.6% of the studies reviewed provided information about reliability of scores for primary dependent measures and even fewer (20.4%) offered information about validity of scores.

Second, reliability of scores based on data obtained from the study sample was reported in only 169 studies. The validity data are more alarming; score validity estimates based on study sample data were reported in just 17 studies.

Third, in over 53% (*n* = 242) of the studies reviewed, researchers chose to operationalize primary dependent variables using author-developed outcome measures. The use of author-developed measures is of concern because many researchers reported no or insufficient information about the psychometric integrity of these instruments.

The reporting practices related to score reliability and validity and the predominant use of researcher-developed instruments are not unique to the early intervention literature. Lawson and LaGaccia (1990) reviewed 328 research articles published in four special education journals between 1985 and 1990. They found that in 66% of the studies the instruments used were author-developed. Only 18.4% of these studies reported reliability data and 21.4% reported validity data. A recent series of Reliability Generalization (RG) studies has shown that the measurement practices found in the present study are consistent with those found throughout the education and psychology literatures (Vacha-Haase, Henson, & Caruso, 2002).

Failure to establish the psychometric integrity of scores derived from dependent measures compromises the meaningfulness of the data and limits the substantive conclusions that should be drawn about the variables under consideration. Not clear from this review is whether researchers failed to evaluate the psychometric integrity of dependent measure scores or merely did not report these estimates.

Concerns about measurement integrity and measurement reporting practices led the Task Force on Statistical Inference (Wilkinson et al., 1999, p. 6) to offer several prescriptive guidelines. The Task Force asserted that authors should provide score reliability coefficients for the data actually being analyzed, even when the focus of the research is not psychometric.

It is not sufficient to report reliability coefficients from test manuals. This warrant for score integrity is called "reliability induction" and is reasonable if, and only if, (a) the compositions, and (b) the score variabilities of the researcher's sample and the inducted sample are both comparable (Vacha-Haase, Kogan, & Thompson, 2000). These inductions require explicit and direct comparisons of compositions and score variabilities (Thompson, 2002).

The Task Force also cautioned that authors who develop their own measures often give insufficient attention to the quality of their instruments. They remarked that once a potentially defective measure enters the literature, subsequent researchers often are reluctant to change it.

Guidelines published in the *Journal of Early Intervention* (Snyder, 2000) offer recommendations similar to those provided by the Task Force on Statistical Inference. In addition, authors who submit manuscripts to JEI are required to avoid characterizing tests as reliable or valid and they must describe the specific type of reliability or validity under consideration. When evaluating future research, editors, authors, and consumers should give systematic and sustained attention to measurement practices and reporting of psychometric evidence to prevent the accumulation of findings and the promulgation of recommended practices based on invalid or unreliable measures.

Treatment Fidelity

Another facet of rigor in quantitative research is the extent to which the independent variable is operationally defined and implemented with fidelity. In 1992, LeLaurin and Wolery proposed research standards for EI related to defining, describing, and measuring the independent variable. One standard suggested by these authors related to inclusion of measures of treatment fidelity (i.e., the integrity with which the independent variable is implemented as planned). They suggested that, at a minimum, the operational definition of the intervention (independent variable) should be accompanied by descriptions of the implementation schedule (e.g., frequency and intensity data). Preferably, treatment fidelity also should be documented by measuring the extent of implementation and describing participants' involvement in intervention.

Slightly less than one-half of the 450 reviewed studies provided information related to intervention implementation schedules. Only 57 studies offered more specific treatment integrity data. These findings suggest that readers of research often are left to assume that an intervention was implemented or applied consistently. This is a potentially deleterious situation, particularly when the research literature is being used to support recommended practices. As LeLaurin and Wolery (1992, p. 286) noted, absence of treatment fidelity information may mean that results are uninterpretable or that intervention effects cannot be explained satisfactorily. In future studies, researchers should produce sufficient documentation related to treatment fidelity and editors and reviewers should not recommend publication of articles that do not offer these data.

Statistical Analyses

Statistical techniques reported in the reviewed studies were evaluated in relation to five general categories of analyses and trends related to these categories were displayed over 9 years. Overwhelmingly, univariate parametric procedures were used most frequently across all years. Although the use of multivariate parametric methods was expected to increase in later years due to the increased availability of statistical packages for personal computers, this trend was not evidenced in the studies reviewed. Further, more advanced statistical modeling techniques also did not increase significantly over time. Perhaps more important than the types of statistical techniques used to evaluate substantive hypotheses is recognition by researchers of what statistically significant test statistics or p values mean and the importance of providing "informationally adequate" or sufficient statistics in published research (American Psychological Association, 2001). Several recent publications provide guidance about these issues that should be helpful in the conduct of future research and in the interpretation and reporting of research results (e.g., American Psychological Association 2001; Snyder, 2000; Wilkinson and Task Force on Statistical Inference, 1999).

Magnitude-of-Effect Indices

As is generally acknowledged (e.g., American Psychological Association, 1994, 2001; Wilkinson and Task Force on Statistical Inference, 1999) but not always widely understood (cf. McCartney & Rosenthal, 2000; Thompson, 2002), probability values associated with inferential statistics do not directly reflect the magnitude of an effect or the strength of a relationship. Thus, the Task Force on Statistical Inference recommended magnitude-of-effect indices always should be presented for primary outcomes and researchers should add comments that place these effect sizes in practical and theoretical contexts. Similarly, the 5th edition of the *Publication Manual of the American Psychological Association* (American Psychological Association, 2001) states, ". . . it is almost always necessary to include some index of effect size or strength of relationship in your Results section" (p. 25). The editorial policies of at least 20 journals, including the *Journal of Early Intervention,* now require reporting of magnitude-of-effect indices (Thompson, 2002).

Only 80 of the studies reviewed reported magnitude-of-effect indices. All reviewed studies were conducted, however, before the expectation to report magnitude-of-effect indices was widely disseminated. Future reviews of the EI research literature should reveal increased reporting and interpretation of magnitude-of-effect indices. McCartney and Rosenthal (2000) insightfully propose that these indices should be considered in context and suggest two main contexts in which effect sizes should be evaluated: scientific and literature-based. The scientific context includes consideration of design, measurement, and method issues that directly impact magnitude-of-effect indices. As these authors note, better measurement, design, and method tend to produce larger effects. Evaluating effect indices within the literature context suggests that researchers should explicitly compare their obtained effects to effects reported in similar research. This process is particularly useful for the accumulation of evidence across studies and the generation of empirical support for recommended practices. For example, if three or more studies concerned with a well-defined and implemented child-focused intervention yield comparable effects for certain groups of children, the weight of the evidence in support of a recommended practice is enhanced.

Summary

The results reported in this paper suggest that the methodological integrity of the quantitative research used to inform recommended practices was not uniformly convincing and compelling. Nonetheless, these research efforts represent the best-available evidence and offer important foundations for future research. As the definition of scientific rigor in EI research continues to evolve and standards related to ensuring rigor in the conduct and reporting of research are refined, the quality of the best-available evidence should be enhanced. In turn, confidence about what constitutes recommended practice should advance and contribute further to the implementation of evidence-based practices in EI.

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Table 1

Number and Examples of Independent or Attribute Variables Reported in Studies by Recommended Practices Category

Recommend Practice Category	Numbers of Variables	Example Variables
Child-focused	255	Type of Play Context Age-of-Start Intervention Disability Status
Family-Based	68	Maternal Education Level Degree of Caregiver Burden Type of Parent Training
Personnel Preparation	41	Type of Consultation Model Professional Discipline Type of Training Setting
Interdisciplinary Models	22	Type of Service Model Team Model Type of Classroom
Systems Change/Policy	11	Size of Locality Type of Placement Criteria Type of Agency
Assessment	10	Time of Assessment Location of Assessment

Recommend Practice Category	Numbers of Variables	Examples of Variables
Technology	8	Type of Assessment Augmentative Device Type Mode of Communication Seating Inclination Angle

Note. Total number of variables equals 415.

Table 2

Number and Examples of Dependent Measures in Different Categories

Category	Frequency	Example Measures
Investigator-developed	242	Interaction Rating Scale (Fallon & Harris, 1991) Survey of transition issues (Shotts, Rosenkoetter, Streufert, & Rosenkoetter, 1994) Behavioral State Observation Scale (Guess et al., 1990)
Commercially-available	78	Battelle Developmental Inventory (Newborg, Stock, Wnek, & Guidubaldi, & Svinicki, 1994) Peabody Developmental Motor Scales (Folio & Fewell, 1983) Peabody Picture Vocabulary Test – Revised, Form L (Dunn & Dunn, 1981) Vineland Adaptive Behavior Scales – Survey Form (Sparrow, Balla, & Cichetti, D., 1984)
Published in other research or limited circulation	124	Family Needs Survey (Bailey & Simeonsson, 1990) Questionnaire on Resources and Stress – Short Form (Friedrich, Greenberg, & Crnic, 1983) Carolina Record of Infant Behavior Family-Focused Intervention Scale (Mahoney,

Category	Frequency	Example Measures
		O'Sullivan, & Dennebaum, 1990) ESCAPE: Eco-behavioral System for Complex Assessments of Preschool Environments (Carta, Greenwood, & Atwater, 1992)
Devices	6	Goniometer

Note. Total number of primary dependent measures = 450.

Table 3

Number of Score Reliability and Validity Estimates

Type of Estimate	Total Number	Number Based on Study Sample Data
	Reliability	
Test-retest	52	22
Internal Consistency	81	43
Parallel Forms	1	0
Inter-rater Reliability	95	71
Standard Error of Measurement	0	0
Inter-observer Agreement	76	62
	Validity	
Face/Content	26	5
Predictive	4	0
Concurrent	31	4
Construct	23	5
Discriminant	4	2
Social	1	1

Note. More than one type of score reliability or validity could be reported in a single study.

Table 4

Number of Studies by Year Using Categories of Statistical Analyses

	Year								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
Number of Studies	41	43	40	60	62	51	53	67	33
Type of Technique									
Univariate Parametric	28	30	30	50	42	43	44	45	31
Univariate Non-Parametric	14	13	6	11	14	11	16	17	7
Multivariate Parametric	5	8	6	12	10	7	14	10	1
Multivariate Non-Parametric	1	1	0	0	0	1	3	2	0
Other[a]	1	0	1	3	6	1	2	5	4

Note. More than one category of statistical analyses could be used in a given study.

[a] Other category includes advanced techniques including structural equation modeling and hierarchical linear modeling.

Table 5

Number of Studies Reporting Magnitude-of-Effect Indices by Category and Type

Category and Type	Number of Studies
Uncorrected variance-accounted-for	
r^2	35
R^2	17
Wilks' Lambda	4
Eta squared	2
Corrected variance-accounted-for	
Adjusted R^2 (Ezekiel, 1930)	1
Omega squared	1
Mean difference	
Cohen's d	5
Glass' delta	4
Cohen's k	1
Other	6

Note. In four studies, magnitude-of-effect values were reported, but the type of index was not specified clearly.

Qualitative Research in Early Intervention/Early Childhood Special Education

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Abstract

Descriptive information about the qualitative research studies that were reviewed as part of the DEC Recommended Practices project is provided. Seventy-four articles that met our criteria were reviewed. These studies were more likely to address issues of families, policy, and personnel preparation than other topic areas in early intervention/early childhood special education. Most of the studies provided sufficient detail in terms of describing the conceptual framework, research strategies and methods, and findings. Limitations of the review as well as suggestions for future directions are offered.

Qualitative research has a long and well-established record in the social sciences. Reports from qualitative research are well represented in the general education research literature. The use of qualitative research methods is not new to special education and disability studies (e.g., Bogdan & Taylor, 1976). However, some have noted that qualitative research is not well represented in the major special education journals (Bogdan & Lutfiyya, 1992; Reid & Bunsen, 1995). Pugach (2001) wrote recently "relative to the larger world of educational research…special education has come to accept and undertake the practice of qualitative research methodology only rather belatedly (p. 440).

The use of qualitative research methods appears to be even newer to early intervention/early childhood special education. The earliest reports in the Journal of Early Intervention that used qualitative methods appeared in 1989 (Kugelmass, 1989; Peck, Hayden, Wandschneider, Peterson, & Richarz, 1989; Salisbury, Britzman, & Kang, 1989) Previous syntheses of the early intervention literature (e.g., Casto & Mastroprieri, 1986; Casto, White, & Taylor, 1983) omit any qualitative studies. In designing a comprehensive literature review of effective practices, the Division for Early Childhood (DEC) Recommended Practices project (Sandall, McLean, & Smith, 2000) included research studies that incorporated qualitative research methods as part of the review of the scientific literature. The purpose of this paper is to describe those reports and their contribution to recommended practices for the field.

Qualitative research is complex, open-ended, and difficult to pin down. However, for the purposes of this paper, we begin with the definition offered by Denzin and Lincoln,

> Qualitative research is multimethod in focus, involving an interpretive, naturalistic approach to its subject matter. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret phenomena in terms of the meanings people bring to them. Qualitative research involves the studied use and collection of a variety of empirical materials…that describe routine and problematic moments and meanings in individuals' lives. (1994, p. 2)

Qualitative research has the potential to increase our understanding of children with special needs, their families, and those who work for and with them. Qualitative research has the potential for increasing our understanding of the intervention issues and challenges posed by these children. Context is crucial to the qualitative researcher. The researcher needs to understand the context within which the data are produced and collected. Understanding the context is key to using the data. Context may mean everyday and ritual activities as they naturally occur in, for example, homes and classrooms. Further, the notion of context extends to the cultural and sociopolitical circumstances in which early intervention/early childhood special education problems and issues occur.

Crabtree and Miller (1992) highlighted two of the distinguishing features of qualitative research. First, qualitative research involves multiple methods. Many different sampling, data collection, and analytic procedures are possible. For example, among the fundamental methods used for collecting information are interviews, observations, and documents or some combination of these. Qualitative researchers choose from the array of methods depending on their purposes and questions. Their methods may alter or expand during the course of the study as more and more information is collected and analyzed. This leads to the second distinguishing feature; qualitative research is recursive and cyclical. Collection and analysis usually occur concurrently. And, the qualitative researcher returns repeatedly to the data and/or the data source.

Ferguson and Ferguson (2000) noted that there is no single dimension or "right way" to do qualitative research. They argue for thoughtful attention to several dimensions of quality. One of the challenges faced by researchers and the reviewers of the research is coming to agreement about these dimensions. McWilliam (2000) tackled this challenge for the Journal of Early Intervention. He outlined four criteria that are considered necessary for submission to the journal. These are: (a) sufficient detail about where the investigator is coming from; (b) sufficient detail about what the investigator did and the methods employed; (c) sufficient detail about how the investigator (s) arrived at the findings; and (d) discussion of the meanings of the findings in relation to theory and implications.

These criteria align with the coding system that was used as part of the DEC Recommended Practices project. In this paper we describe the outcomes of the review of the research literature in early intervention/early childhood special education (EI/ECSE) from 1990 to 1998. The focus of this paper is on those articles that employed qualitative research methods.

Method

The DEC Recommended Practices project is described in Sandall, McLean and Smith (2000). The methods undertaken to identify the recommended practices are described in the article by Smith and colleagues in this issue.

Procedures

The literature review was conducted in multiple steps. The articles to be reviewed were identified from 48 peer-reviewed journals relevant to early intervention/early childhood special education. Project staff reviewed the table of contents. Next, the article abstract for each research article was reviewed to determine if the article met the criteria for inclusion in the study. The article had to be an investigation of an intervention provided to children with disabilities, birth through five and/or their families or those who serve them. Articles that passed this screening were categorized by research design: group quantitative, single subject design, descriptive/survey design, qualitative design, and mixed method design.

The articles were then reviewed using two coding sheets. Reviewers used coding sheet A, a generic coding sheet, across all of the research designs. Coding sheet B, the specialized coding sheet, was developed to describe the article according to criteria appropriate for that design.

Specialized coding form

The specialized coding sheet for the qualitative research reports was developed based on review of criteria proposed in textbooks and articles on qualitative research (e.g. Denzin & Lincoln, 1994; Lincoln & Guba, 1985; Strauss & Corbin, 1990), and discussions with experienced qualitative researchers. The coding form was sent to two researchers in EI/ECSE and based on their comments and suggestions, revisions were made and the final coding form produced. The coding form recorded the following information: conceptual framework, focus of the study, type of study, description of procedures, data sources, length of data collection, description of analysis, evidence of credibility, findings in relation to theory, recommended practice(s) supported by the study, and the strand or topic area that the practice reflected.

Coders

There were seven coders for the qualitative studies. All had experience conducting qualitative research. Training began with reading the coding forms and supporting materials. Coders then coded one article that was not part of the data set. Next, the coder participated in an in-person or telephone conversation with the methodology consultant. The coder then coded two or more additional articles that were not part of the data set until reaching a level of 85% intercoder agreement with the methodology consultant. Coders did not obtain this level of agreement for one item - type of study. Originally, coders were given a menu and asked to categorize the study. After lengthy conversations about the discrepancies found in coding this item it was determined that rather than having the coder determine the type of study (i.e., design or research strategy) and place it into a category, the coder simply used the researcher's own words to describe type of study. Each article was read and coded by one coder. A second coder read approximately one-third of the articles to confirm the recommended practice that was supported by the article.

Results

Following initial screening of articles, there were 109 articles using qualitative methods. Thirty-five were eliminated as they were found not to meet the inclusion criteria or did not support a recommended practice. Thus, there were 74 articles using qualitative methods that were included in the final literature review. This represents 9% of the total research articles reviewed. When looking at publications by year, we found that there were 6 articles published in 1990, 5 in 1991, 4 in 1992 and in 1993, 7 in 1994, 9 in 1995, 13 in 1996, 14 in 1997, and 12 in 1998.

Coders also assigned articles to a recommended practice(s) strand. Qualitative articles most often supported the family-based (24), policies/procedures/systems change (22) and personnel preparation (22) strands. Articles supported other strands less often: child-focused (12), interdisciplinary (7), and technology (2). No qualitative studies were assigned to the assessment strand.

Coders recorded whether or not the researcher described the conceptual framework for the study. Conceptual framework meant that the problem or area of study was placed within a body of theory and practice. Forty-four of the 74 articles (59%) provided an adequate description of the conceptual framework.

Qualitative studies may use any number of designs or strategies, methods for collecting information and methods for selecting participants. The study may, in fact, evolve over time. In coding the studies, reviewers looked for detail in the desciption of the methods and procedures used.

Among the varied strategies of inquiry (or design) that a researcher might use are ethnography, case study, and biography. As noted earlier, coders found it difficult to record reliably the type of strategy when using predetermined categories. Using the researcher's own words, we found that the majority of researchers (41) described their study as qualitative (55%). Eighteen studies (24%) were called an ethnography. The remaining articles were dispersed among several other research strategies.

The qualitative researcher has several methods for collecting information. Observations were used in twenty-six studies (35%). These were usually combined with field notes. Interviews of various types (e.g., individual, group, formal, unstructured) were used in sixty-five studies (88%). Twenty studies (27%) reported the use of documents and artifacts. Sixteen studies (22%) used other methods. In thirty-two of the studies (43%), some combination of data collection method was used.

In that a variety of methods can be used for collecting information and for determining from whom information is collected, we wanted to know if researchers provided careful, detailed description of their methods. Coders found that 59 studies (80%) provided detailed description of the procedures used to select participants. Sixty-one (82%) provided detailed description of the data collection procedures.

The researchers reported a variety of techniques for determining the trustworthiness of the data. Trustworthiness refers to four major concerns: truth value, applicability, consistency, and neutrality (Lincoln & Guba, 1985). Techniques reported included member checks (26), multiple methods (24), intercoder reliability checks (22), multiple sources (19), keeping an audit trail (5), and other (34). Forty of the reports (54%) used more than one technique.

An indicator of the credibility of the data has to do with whether or not the researcher has engaged with the participant and/or site for a sufficient period of time. Fifty-six studies (76%) reported the length of the data collection period. This ranged from a single interview to three years of contact with the participants.

Qualitative researchers arrive at their reported findings through construction of their interpretation. Lincoln and Denzin (1994) wrote that interpretive practice is both artful and political. McWilliam (2000) recommended that reviewers look for sufficient detail in terms of a thoughtful, informed process. In the articles reviewed, researchers described their analytic procedures in varying levels of detail and in varying ways. Some, for example, provided charts that detailed the analytic steps. Coders found that 51 of the articles provided detailed description, 61 were judged to have used an appropriate analytic method, and 40 were judged to be inductive. Thirty-four of the articles (46%) were coded as detailed, appropriate, and inductive.

Finally, coders assessed whether or not the study provided a discussion of the meaning of the findings in relation to theory. That is, coders looked for an explanation of how the findings advanced theory. Thirty-eight studies (51%) were found to have done so.

Discussion

The purpose of this paper was to provide more information about the qualitative studies that were reviewed for the DEC Recommended Practices project. The literature review encompassed the period from 1990 to 1998. During that time period qualitative research designs were used rarely. This finding is consistent with previous reports of the special education literature (Reid & Bunsen, 1995). However, it appears that there was an increase in the use of qualitative research methods in early intervention/early childhood special education during the time period studied.

For the most part, the qualitative studies centered on issues and questions of policies, families, and personnel preparation. Qualitative methods were not used across all of the strand or topic areas.

Most of the studies reviewed provided adequate description of the primary indicators of quality of qualitative studies. On items related to description of the conceptual framework, selection of participants, data collection methods, indicators of trustworthiness, analytic steps, and relation to theory, 50% or more of the studies were coded as providing sufficient detail. That means, that there were published studies that did not adequately address these indicators.

There was more difficulty in providing a careful description of the design or nature of the inquiry. This posed a problem for establishing reliability but when we recorded the researcher's words we found that most simply described their study as a "qualitative study". Qualitative researchers and those who write about qualitative research come from a variety of different traditions, perspectives, disciplines, and historical time periods. This may explain why the terminology is sometimes confusing. It may also explain why most researchers whose studies were reviewed for this project elected to use the most general term to describe their research strategy.

This report has a number of limitations. The articles reviewed were drawn from a pool of 48 peer-reviewed journals. Thus, articles appearing in journals not on our list were not reviewed. Further, qualitative studies lend themselves to longer, richer narratives than are possible in many journals. Books and chapters were not reviewed so again, important papers and findings may have been missed.

Researchers may use qualitative methods while not embracing fully an interpretivist approach to their thinking about and doing research. In this project we did not examine the researcher's point of view but rather accepted studies that used generally accepted qualitative methods as fulfilling our requirement as qualitative research.

Qualitative studies may confirm or test theory. More likely, qualitative studies are formulated in order to describe phenomena or to discover or generate theory. Therefore, qualitative studies that appeared in the literature during this time period but did not investigate an intervention were not included in the review. This another reason why this report cannot be considered a comprehensive review of the qualitative research in early intervention/early childhood special education. The current review does contribute to our understanding of the use of qualitative research methods to address questions of EI/ECSE practice during the time period of 1990 to 1998.

The findings do suggest some next steps and future directions. First, a larger review could be undertaken that examines all of the qualitative studies in EI/ECSE that were reported in the 1990s and to the present. Such a review could provide a better picture of how and when these methods are used. The current review found that qualitative methods were most often used to study issues related to families, policies, and personnel preparation. A deeper analysis of these studies would offer a better understanding of the kinds of questions that were asked and the kinds of interpretations that were derived from the information collected. Qualitative research is well suited to providing a "voice" for the various stakeholders in early intervention/early childhood special education by listening to their voices and considering their voices within the full context of their experiences. Qualitative research can broaden and deepen our understanding of the experience of disability for young children, family members, teachers, and therapists. Qualitative research can extend our understanding of the ways that services are organized and provided. This research approach can illuminate problems and issues in early intervention/early childhood special education and potentially help to transform practice.

Qualitative studies accounted for a relatively small portion of the published literature and consequently, the literature reviewed for the Recommended Practices project. From 1990 to 1998 we saw an increase in the number of published studies using qualitative methods. The influence of qualitative research on the practice of early intervention/early childhood special education is a story that is yet to be written.

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Practices Across Disciplines in Early Intervention: The Research Base

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Abstract

The most recent compilation of *DEC Recommended Practices in Early Intervention/Early Childhood Special Education* (Sandall, McLean, & Smith, 2000) contains 240 recommended practices across 7 strands. The recommended practices evolved from a process involving input from literature reviews, scientific experts, 9 stakeholder focus groups, and field validation of the synthesized practices (Sandall, McLean, & Smith, 2000). One of the 7 strands addresses recommended practices in interdisciplinary models. The 19 practices in this strand emphasize teamwork, loose boundaries between disciplines, functional intervention, and support to caregivers. The article describes the process used to identify these 19 recommended practices by focusing on the literature base of 30 articles that supports the interdisciplinary models strand. An analysis of the literature will be used to understand the types of research (e.g., qualitative or quantitative) and the elements (e.g., study setting, study participants) used to support particular practices. The article will also suggest how these recommended practices can become the foundation by which practitioners in early intervention/early childhood special education go about their daily routines and practices. By examining the empirical base in the published literature, it is possible to suggest modifications that could help a team move towards meeting recommended practices and suggest future research endeavors to strengthen the empirical support available in this field.

The Development of Recommended Practices

Many professions view the development of recommended practices as a means by which they can provide information and support to their constituents while attempting to insure that a level of best practice is achieved. Documents containing best practices have been developed by a variety of sources and come in the form of guides, standards, and position statements. Within the early childhood field, descriptions of what adults should do with young children has been a staple of the literature at least since 1986. It was during that time that the term "developmentally appropriate practices" began to be used to describe programs serving children from birth to age 8 (National Association for the Education of Young Children, 1986a) and for 4- and 5-year-olds (National Association for the Education of Young Children, 1986b). By 1990, developmentally appropriate practices and inappropriate behaviors were being measured in observational studies (Burts, Hart, Charlesworth, and Kirk, 1990; Hyson, Hirsch, & Rescorla, 1990), followed by definitions of best practices in kindergarten (Bryant, Clifford, & Peisner, 1991; Zepeda, 1993). By 1993, the effectiveness of practices labeled *developmentally appropriate* were debated in early childhood special education circles (Carta, Atwater, Schwartz, & McConnell, 1994; Guralnick, 1993; Johnson & Johnson, 1993).

More recently, the National Association for the Education of Young Children (NAEYC) has published position statements on developmentally appropriate practice (DAP) for educating and caring for young children (Bredekamp & Copple, 1997). Another contribution to guide professionals in their practice with young children comes from the Head Start Performance Standards (Administration on Children, Youth, and

Families, 1999). When looking more specifically at practices aimed at the education or early intervention of young children with disabilities, there are the DEC Recommended Practices (Sandall, McLean, & Smith, 2000). These recommended practices "are intended to help meet the individual and unique needs of young children with disabilities and their families" (Sandall, McLean, & Smith, 2000, p. 10).

Other related professional organizations and fields also have documents that provide a resource to their membership regarding the nature of the practice. The Guide to Physical Therapist Practice (APTA, 2001) is an example of a product developed within and for a specific profession by a professional organization. It identifies common features of patient/client management, but it does not provide specific protocols for treatments or clinical guidelines. Nor does it require that a physical therapist adhere to its recommendations in order to practice as a licensed allied health professional. Volume I was published in 1995, and Volume II followed in 1997. These two volumes were later joined and renamed Part One and Part Two of the Guide to Physical Therapist Practice, and the second edition of both parts resulted in the most recent version published in 2001 (APTA, 2001).

DEC initiated an effort in 1991 to summarize the early intervention/early childhood special education (EI/ECSE) knowledge base. These efforts resulted in a list of 405 recommended practices first published in 1993 (DEC Task Force on Recommended Practices). These practices were derived from stakeholder focus groups and validated by a national sample of 500 individuals, but the process did not include a systematic review of the literature. In 1998, DEC leaders secured a federal grant to update and revise the 1993 list of recommended practices.

Not only were the practices updated, but a more rigorous process was used to carefully develop a set of recommended practices that could be implemented at the child, family, and systems levels. Much of the additional rigor used in the revision of DEC's recommended practices was based on the commitment by DEC to include a review of the literature as a basis upon which to build from the empirical research into practice.

The Methods Used to Update the Recommended Practices

Recommended practices in EI/ECSE emerged after an arduous process involving input from literature reviews, scientific experts, and stakeholder focus groups (Sandall, McLean, & Smith, 2000). Although the focus of this article is the literature base for the interdisciplinary-models practices, it is important to understand the process through which the recommended practices were developed and validated. The process began with scientific expert and stakeholder (parents, practitioners, administrators) focus groups meeting to develop a list of suggested practices. Simultaneously, investigators began an examination of empirically based research published in peer reviewed journals from 1990 through 1998. Individual coders read articles and completed two coding sheets for each article. A generic coding sheet was used uniformly across all articles. This coding sheet recorded the following information: article title, authors, journal, year, general description of participants, gender of participants, mean age, ethnicity, disability, severity level of disability, educational level of family members, income level of family members, and study setting. A specialized coding sheet designed specifically to highlight additional information about research rigor based on the method used in the articles was also completed. The specialized coding sheets were used to insure that each article was appropriately reviewed according to the research method used in the article (Smith, Strain, Snyder, Sandall, McLean, Karney & Sumi, submitted for publication).

The results of the coding process were verified by intercoder agreement across the group of 42 first-stage coders and by 29 additional coders who independently read and coded approximately one third of the articles. In addition to this review and examination of the empirical literature base, stakeholder focus groups were used to further define practices in each strand. Finally, a national field validation was used to confirm the list of 250 practices supported by both literature and focus groups. Criteria that queried both the respondents' agreement with the concept of each item as a recommended practice and the frequency with which the item occurred resulted in all 250 practices being validated (McLean, Smith & Sandall, submitted for publication). A final review by project investigators to eliminate redundancy resulted in a list of 240 recommended practices.

Thus, the process resulted in 240 practices representing seven different strands that had been selected prior to the identification of the practices. One of these seven strands of recommended practices is the one on "interdisciplinary models". This article summarizes the literature only from the interdisciplinary models strand. The interdisciplinary strand was organized into practices that support working together, cross-disciplinary boundaries, focus on function, and that highlight regular caregivers and routines (McWilliam, 2000). These four themes emerged from the expert focus group and were supported, to a large extent, in the literature.

Table 1 shows the 19 recommended practices and the groups or the literature that supported each practice. In addition, the table provides information on some characteristics of the studies reported in the literature and identified as supporting an interdisciplinary practice. The interdisciplinary strand consists of 19 recommended practices suggested and supported by three stakeholder groups: practitioners, administrators, and families. An independent search for practices falling into this strand, or category, (interdisciplinary models) was conducted. Many of these interdisciplinary recommended practices were supported through a literature base of 30 articles that had been reviewed and published in peer-reviewed journals. The practices in the literature were matched against the practices identified and confirmed by experts and stakeholders. Twelve of the 19 recommended practices have one or more references in this body of literature. Four have one reference, 4 have two references, and 4 have more than two references. Five of the practices are not supported by literature or by a stakeholder group but were determined by the expert focus group and project investigatorsto be included as recommended practices in EI/ECSE. Two practices were identified early in the process by a stakeholder group as a part of the Learning Environments Strand. The practices that emanated from the Learning Environments Strand were eventually subsumed into one of the other strands of recommended practices later in the process. None of literature-based interdisciplinary practices was dropped.

Insert Table 1 here

The 30 articles represent several different types of study designs. As Table 1 shows, by far the most common design was a group design (N=60%), but a considerable proportion of the studies used qualitative methods (N=23%). Only a few (5 studies or 17%) used single-subject (N=2), survey (N=2), or mixed methods (N=1). The study settings included children's homes (N=9), segregated classrooms (N=5), integrated or inclusive classrooms (N=5), hospital or clinic-based settings (N=4), and other settings in the community (N=11). The study participants consisted of personnel (N=12), children with disabilities (N=15), typically deveoping children (N=3), families of children with disabilities (N=11), and families of typically developing children (N=1). Several of the studies were executed in more than one location (e.g., home and segregated class) and included more than one type of study participants (e.g., families and personnel). In addition, many of the studies (N=9) included multiple disability types or diagnoses across the study participants. These often included cerebral palsy, developmental delay, mental retardation, speech and language impairment, and behavior disorders. Several studies focused on a more specific group by including only participants from one or two identified diagnoses such as children with sensory impairments (vision and hearing) (N=2), developmental delay (N=3), or Down syndrome (N=1).

Interdisciplinary Models

Before exploring these recommended practices in greater detail, it is important to understand the meaning and the use of the term *interdisciplinary models*. The terms *interdisciplinary* and *transdisciplinary* are often confused and, on occasion, are used interchangeably. Although the two are not necessarily synonymous, they both represent the concept of persons from multiple professional backgrounds and expertise working together towards assisting the child and family to achieve one set of goals and objectives or outcomes. Thus, whereas *interdisciplinary* refers to the fact that there is interaction among professionals from different disciplines, transdisciplinary refers to a specific way in which those interactions occur (McWilliam, 1996). Although leaders in early intervention are strongly in favor of the transdisciplinary approach (see Harbin, McWilliam, & Gallagher, 2000), it is viewed with caution among some practitioners from specialized disciplines. The DEC therefore chose the broader term as being more inclusive of the concept of working together with others. Despite these differences in terminology, the interdisciplinary recommended practices clearly convey the notion that EI/ECSE should be provided by a team that works together.

To understand the interdisciplinary recommended practices better, it is helpful to examine the literature base of 30 articles from which many of these practices were generated and supported. The articles were published in 18 journals with the largest groups of articles (each $n = 4$ or 13%) coming from *The American Journal of Occupational Therapy* and *Topics in Early Childhood Special Education*. Two other journals, the *Journal of Early Intervention* and *Pediatric Physical Therapy*, were a source for three articles or 10% of the literature base each. Thus, almost half of the total literature base for the interdisciplinary recommended practices is published in only four journals.

Looking at Specific Recommended Practices and Their Literature Base

Slightly over 30% of the practices in the interdisciplinary strand were not confirmed by any empirical literature. These six practices were identified by the expert focus group or by one of the stakeholder groups and later validated by the field during the process described in an earlier section of this article. The practices span several different themes and cannot be linked to any one area of policy, intervention, or skill. Their commonality arises from the understanding that all are important in the delivery of early intervention services or early childhood special education through an interdisciplinary model or array of services.

Four practices in the interdisciplinary models strand were recommended by the scientific expert group but not supported by the literature or by a stakeholder group:

- Team members are knowledgeable about funding and reimbursement policies and advocate for policies that support recommended practices;
- Team members use a transdisciplinary model to plan and deliver interventions;
- Team members select child and family priorities for intervention based on child and family functioning (not services) and determine what is interfering with growth or progress in each priority area; and
- Team members use activities within the range of current functioning (i.e., individually appropriate activities).

In addition to these five practices, three additional interdisciplinary recommended practices were supported only by a single stakeholder group (either Practitioner Stakeholder Group or Learning Environments Focus Group) but not by any empirical literature:

All team members participate in the IEP/IFSP process;

- Team members plan to provide services and conduct interventions in natural learning environments; and
- Team members focus on the between-sessions time (i.e., build in activities that can be carried out across time and contexts).

Why the Field Should Move Ahead With a Limited Literature Base

Despite the weak literature base available to support the 19 interdisciplinary recommended practices, it is essential that the field of EI/ECSE move ahead to implement the practices in home and community based settings. Nothing would be gained by failing to recognize the value of a recommended practice that has been lauded by experts and practitioners in the field simply because the current literature base fails to contain sufficient evidence that addresses the particular practice. The rate of published research to guide practice is lower than the rate at which practices are actually needed to meet the needs of children and families. The early intervention field across disciplines has had a mixed history of tying together research and practices. Practices range from those that are proven to those that are unproven and from those that are commonly employed to those that are uncommon. Figure 1 shows these two dimensions of research support and the frequency of use of early intervention practices recommended by the field. Four examples have been drawn from the interdisciplinary models practices, to show how each of these practices can be evaluated using the two-dimensional model in Figure 1. Because we do not have the data on usage of each practice, we cannot accurately place any of the 19 interdisciplinary recommended practices across the two dimensions. However, individual practitioners and administrators can estimate the frequency with which each practice is found in their community or setting and can examine Table 1 to determine the extent to which a practice is supported by research.

A number of practices and positions in early childhood have moved forward with only limited empirical data supporting them. Inclusion is an example of such a practice. Particularly in its earlier days, the concept of inclusive classrooms was recommended and encouraged long before there was a literature base to provide conclusive support of this practice. There are a number of therapeutic interventions implemented by related service personnel (e.g., occupational therapists and physical therapists) that currently are limited in acceptance by a lack of reported evidence or a strong research base to support them. Even so, many of these interventions are used effectively, according to therapists reports, on a daily basis with young children in home, school, community, hospital, and clinic based settings.

Just as the health care system is now requiring greater accountability through evidence-based practice, EI/ECSE practitioners could conduct action research, for example, and build efficacy through data collection as part of daily practice (methodological rigor notwithstanding). Without the ability to demonstrate successful outcomes that have been measured and recorded through such research, a sense of skepticism looms over the ability of the field to demonstrate that it is knowledgeable and progressive. Along the same vein, it is important to examine objectively any questionable to insure that the field moves forward with practices that truly represent what we know to be the best.

It is important that all members of the early intervention team not lose sight of the need for empirical support as a means of supporting the practices that we assume to be the best for children and families. Although observation, experience, and shared interactions all support some of the practices we believe to be the best, there continues to be a need for an empirical base to provide a strong foundation.

The Practices

Teamwork and Family Decision Making

Because of the perceptions of stakeholders, and as a result of the literature, DEC has recommended 19 practices for providing early intervention across disciplines. The first six practices deal with teams including family members' making decisions and working together (see Table 1). The underlying themes of these practices are that professionals should work in harmony (not at cross purposes or in a hierarchical manner) and that natural caregivers should be supported (not usurped by a service-driven system or expert-model consultation). The role of families in these practices reflects a "collective empowerment model" (Turnbull, Turbiville, & Turnbull, 2000, p. 641), in which both professionals and families achieve mastery over their resources to reach their desired goals. Turnbull et al. discuss the "synergistic power" (p. 642) that is essential to this model and make the following six assumptions: (a) centrality of the family, (b) decision making based on family choice, (c) focusing on family strengths, (d) access to resources, (e) family participation in the process, and (f) changing the community ecology. In general, early interventionists across disciplines are encouraged to work together and with families not just in a new way but with a new way of thinking.

Transdisciplinary Service Delivery

The next grouping of practices involve crossing disciplinary boundaries. Bruder (1997) has discussed the importance of transdisciplinary service delivery in the context of curricula for children with disabilities:

> "Interventions from specific therapeutic disciplines can result in a child learning isolated skills that have minimal relevance to the remainder of the intervention

> program.... As second-generation research on early childhood intervention expands, individual therapeutic interventions must be encompassed within a larger curriculum framework that identifies all teaching (e.g., including therapy) episodes." (p. 538)

In home-based services, especially, professionals' willingness to engage in role release and role acceptance (Practice 7) and to use a transdisciplinary model to plan and deliver interventions (Practice 8) can result in several fundamental shifts in the way early intervention is carried out. First, engaging in role release will allow professionals from different disciplines to add consultation expertise to their existing skills (Hanft & Place, 1996). Second, they will approach children and families from a holistic viewpoint rather than holding fast to a domain- or discipline-specific approach, thereby allowing collaborative problem solving to occur (Utley & Rapport, 2000). Third, they will be engaged in ongoing staff development as they learn from their colleagues (through role acceptance). Although transdisciplinary service delivery (Chapman & Ware, 1999; Lamorey & Ryan, 1998) is threatening to many professionals, especially when they have only passing familiarity with the idea, teams using it have reported positive effects on their personal and team development (Kaczmarek, Pennington, & Goldstein, 2000).

Focus on Function

Eight additional interdisciplinary practices deal with intervention focused on function, not services. For example, a service focus might involve prescribed "oral-motor" activities to increase a child's oral-motor tone but focuses instead on the service necessary to increase tone. This is considered a service focus because the intervention does not address why a child needs to have better oral-motor tone. Furthermore, the specific treatment activity describes or implies a singular approach that might or might not fit into the child's ecology. In contrast, a function focus might involve teaching the child to chew so he can eat more solid food. Or it might involve teaching the child to use two-syllable words to label objects and people so he can better express his needs and desires. Note that both of these functions (i.e., chewing and speaking) could have been the reason or outcome for the "oral-motor" activities. A service focus does not readily identify the functional outcome, whereas a function focus—by definition—does. Another important point of a function focus is that interventions tend to be (a) appropriate for regular routines, (b) able to be carried out by regular caregivers (versus specialists only), and therefore (c) are naturally delivered at a higher rate (multiple times a day) than service-focused interventions that are directly linked to intervention provided by a specialist (e.g., once a week).

The following checklist identifies characteristics embedded in the interdisciplinary recommended practices listed in Table 1:

1. Identify the contexts in which the child lives (e.g., routines, activity settings) and use these to organize assessment;
2. Change where, when, and how the child receives intervention, as necessary;
3. Make interventions natural to the child's and family's life;
4. Whenever possible, seek reimbursement for "indirect" services, especially consultation—and definitely consultation to natural caregivers, at the same rate as "direct" services, since the value of this service may ultimately be just as significant as the therapist providing direct intervention to the child.

5. Use the least-to-most principle about intrusion, assistance, or prompting with children and families (Wolery, Ault, & Doyle, 1992).

Caregiver-Mediated Intervention

The final three interdisciplinary practices indicate a key principle in a modern, functional approach to working across disciplines: intervention for the child depends on what occurs between professional sessions (McWilliam, 2000; McWilliam & Scott, 2001). That is, children learn skills and make developmental gains as a result of repeated interactions with their environment, dispersed over time, not in massed trials once or twice a week. The concept of "integrated instruction and therapy" (p. 514) has been described as a key factor influencing the implementation of environmental arrangements and strategies for teaching preschoolers with disabilities (McWilliam, Wolery, & Odom, 2001). Current thinking even from single disciplines, as in this case (speech-language), includes an understanding that (a) natural environments are suitable intervention contexts from a social-interactive language theory perspective, (b) consultative approaches allow language to be seen in its social context, (c) in-class models are better than pull-out for generalization of skills, and (d) pull out services for intervention should be used thoughtfully if at all (Paul-Brown & Caperton, 2001). Because many of the services represented by the different disciplines in early intervention are provided intermittently, recommended practices state that those sessions focus on supporting regular caregivers (i.e., the people who spend enough time with the child to make a difference) to carry out effective interventions. This fundamentally changes the role of some of these services, which might have been based on a model more appropriate for older children or even adults—a model based on the client's absorbing the massed-trial information in a session and then transferring it to real-life situations. In early intervention, an adult is needed to effect that transfer, because young children learn in context—not in isolation of context (Dunst, Hamby, Trivette, Raab, & Bruder, 2000).

In no way does this diminish the importance of the individual disciplines. In fact, the functional model discussed here recognizes that professionals from the various disciplines have expertise that is very much needed by regular caregivers. Some of the challenges for professionals as they come to understand this *modus operandi* are that (a) intervention suggestions need to be customized to the individual caregiver, who might not carry out the interventions the way the professional would if the professional lived with the child; (b) professionals will need to give credit for child progress to caregivers (or at least share it with them); and (c) hands-on work with the child (which will continue) will be limited more specifically to demonstration, assessment, and showing the caregiver that the professional loves the child; seldom will it be to teach the child directly. These challenges are not insignificant, and some professionals overgeneralize these ideas to conclude that the functional approach means their discipline is not valued, they will never work with the child again, or they have assumed the role of a social worker. Of course, this is not true, but it does show that an understanding about how children learn and how intermittent services can help them does not come easily to many professionals isolated within the training and structure of their own discipline.

Conclusion

The professional who uses these interdisciplinary recommended practices successfully has to know child functioning and intervention strategies, family and classroom functioning, and collaborative consultation skills. When professionals have this wide array of knowledge and skills, they are respected and highly valued by their colleagues from other disciplines and they add to the outcome of effective and efficient early intervention for young children with disabilities and their families.

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Figure 1. Dimensions of research support and frequency of use for early intervention practices, with examples from interdisciplinary models.

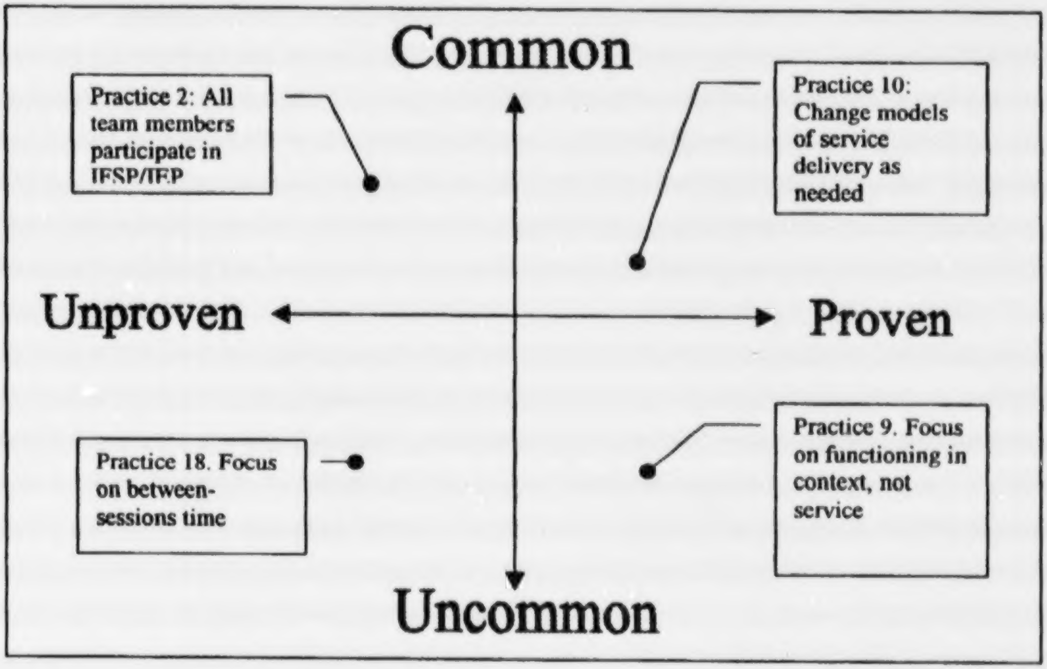
Common
Practice 2: All team members participate in IFSP/IEP
Practice 10: Change models of service delivery as needed
Unproven
Proven
Practice 18. Focus on between-sessions time
Practice 9. Focus on functioning in context, not service
Uncommon

Table 1
Support for Recommended Practices

DEC Recommended Practices: Interdisciplinary Models	Supported by Stake-holder Group	Supported by Literature Reference (total = 30 references)	Study Type	Study Setting	Study Partici-pants	Type of Disability
Teams including family members make decisions and work together						
1. Families and professionals, including regular caregivers, work as team members in planning, delivering, and evaluating EI/ECSE services.	Practitioner Stakeholder Group	1571 1578	Group Group	 Segregated Class	Personnel Children with disabilities	 Other – Dual Sensory Impairment
2. All team members participate in the IEP/IFSP process.	Practitioner Stakeholder Group					
3. Team members are knowledgeable about funding and reimbursement policies and advocate for policies that support recommended practices.						
4. Team members support an optimum climate for all caregiving adults to ensure trust, collaboration, and open communication.	Learning Environments Strand 11	1079 4042 4057	Group Qualitative Qualitative	Home Other, home	Families Personnel Families	Variety – CP, DD, SL, etc.
5. Team members make time for and use collaborative skills when consulting and communicating with other team members,	Practitioner Stakeholder Group	1345	Group	Segregated Class	Children with disabilities	Variety

including families and regular teachers and caregivers.		3037	Single Subject	Inclusion Class	Children with disabilities	Variety
		3181	Single Subject		Personnel	
		4035	Qualitative	Other	Families	
		4093	Qualitative	Home & Segregated Class	Families, Personnel	Other – neuromotor disabilities
6. Team members support paraeducators so they are treated respectfully and used most effectively.	Practitioner Stakeholder Group	1472	Group		Children with disabilities	Other
Professionals cross disciplinary boundaries						
7. Team members engage in role release (i.e., help others learn each other's skills) and role acceptance (i.e., be prepared to learn other's skills).	Practitioner Stakeholder Group	4040	Qualitative	Other	Families Personnel	
8. Team members use a transdisciplinary model to plan and deliver interventions.						
Intervention is focused on function, not services						
9. Team members focus on the individual child's functioning (e.g., engagement, independence, social relationships) in the contexts in which he or she lives, not the service.		1264	Group	Inclusive Class, Home	Families of typical children & Families of children with	Variety

					disabilities	
		1575	Group	Segregated Class, Inclusive Class	Children with disabilities, Personnel	Variety
10. Team members change models of service delivery (e.g., location) as needed, continuously monitoring what the child can do, what the child is doing, and what the family needs, to decide how to serve them.		1340	Group	Other	Personnel	Other – infants in NICU
		1466	Group	Home, Hospital/ Clinic	Children with disabilities, Families of children with disabilities	Speech Language Impairment
		2152	Mixed	Other	Families of children with disabilities	
11. Team members select child and family priorities for intervention based on child and family functioning (not services) and determine what is interfering with growth or progress in each priority area.						
12. Team members decide on supports (a) that meet the priorities, (b) that are based on environmental resources and constraints, and (c) that are known to be helpful.		4018	Qualitative	Home	Children with disabilities, Families of children with disabilities	Cerebral Palsy
13. Team members decide on each intervention variable – how to intervene, who should intervene, when the intervention should occur,	Practitioner Stakeholder Group	1225	Group	Segregated Class, Hospital/	Children with disabilities	Developmental Delay

intervene, when the intervention should occur, and where the intervention should occur – based on (a) relevance to the priority (i.e., the functioning the family desires), (b) environmental resources and constraints, and (c) likelihood that it will help.				clinic		
		1266	Group	Hospital/ clinic	Personnel	Developmental Delay
		1463	Group	Other	Personnel	
		1465	Group	Other	Children with disabilities	Developmental Delay
		1483	Group	Home	Children with disabilities, Typical children	Down Syndrome
		1554	Group	Hospital/ Clinic	Children with disabilities	Cerebral Palsy
		2056	Short-form (survey)	Other	Personnel	
14. In IFSPs/IEPs team members define therapy and specialized instruction to include indirect or consultative services.		2117	Short-form (survey)	Other	Personnel, Children with Disabilities	MR, DD, Autism, Other – Mental Health
15. Team members use the most normalized and least intrusive intervention strategies available that result in desired function.		1453	Group	Other	Children with disabilities, Typical children	Variety
		4071	Qualitative	Inclusive Class	Children with disabilities, Families of children with	Hearing impaired/deaf, visually impaired/blind

					disabilities	
16. Team members use activities within the range of current functioning (i.e., individually appropriate activities).						
Regular caregivers and regular routines provide the most appropriate opportunities for children's learning and receiving most other interventions						
17. Team members plan to provide services and conduct interventions in natural learning environments.	Learning Environments Strand 1					
18. Team members focus on the between-sessions time (i.e., build in activities that can be carried out across time and contexts).	Learning Environments Strand 9					
19. Team members recognize that outcomes are a shared responsibility across people (i.e., those who care for and interact with the child) working with the child and family.		1119	Group	Home, Other	Personnel, Families of children with disabilities	Variety
		1391	Group	Home, Inclusive Class	Typical children, Children with disabilities	Other – spina bifida

The DEC Recommended Practices in Early Intervention/Early Childhood Special Education: Field Validation

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Abstract

Results are reported from the field validation of the DEC Recommended Practices as part of a national effort by the Division for Early Childhood (DEC) of the Council for Exceptional Children (CEC) to develop evidence-based practices for Early Intervention/Early Childhood Special Education. Validation surveys were received from 388 individuals including practitioners, parents and administration/higher education personnel. All of the practices were supported as recommended practice by the respondents. Additional information was obtained from the respondents about the extent of current use of the practices.

The DEC Recommended Practices In Early Intervention/Early Childhood Special Education: Field Validation

In the fall of 1998, DEC and several university partners were awarded a federal grant to update and revise the original DEC Recommended Practices that were developed in 1993 (DEC Task Force on Recommended Practices, 1993). The procedures for accomplishing this task were completed in three stages. The first stage involved the generation of recommended practices. This stage was accomplished by analyzing the empirical research literature and conducting focus groups with key stakeholders in the field including content experts, family members, practitioners, and administrators. The second stage involved the synthesis of practices identified by focus groups with those identified from the literature. The procedures followed in stages one and two are described in more detail in Smith, McLean, Sandall, Snyder, and Broudy (2000). The third stage of this process involved the field validation of the practices, which is the focus of this paper.

The purpose of this field validation was to obtain ratings from key stakeholders in the field relative to the validity of the practices which emerged from the review of the literature and the focus groups. A national validation was conducted for the original DEC Recommended Practices (Odom and McLean, 1996). The results of that field validation served as a measure of social validity, and also measured the extent to which respondents had experienced the recommended practices in programs with which they were familiar. The field validation for the revised set of DEC Recommended Practices was designed to serve the same two purposes.

Assessing the social validity of practices which are being recommended to members of a professional discipline is a means of evaluating the acceptability of the practices to the constituent stakeholders (Wolfe, 1978) and thus also the extent to which the practices are likely to be implemented by the stakeholders (Baer, 1986). The overall importance of measuring social validity was emphasized by Peters and Heron (1993) who proposed social validity as one of five criterion to be used when identifying best practices; other criterion included a sound theoretical base, convincing and compelling methodology and design, consensus with the literature and production of desired outcomes. Social validity was assessed by Meyer, Eichinger and Park-Lee (1987) in their work to identify and validate program quality indicators for students with severe disabilities. Meyer et al. included groups of participants in their validation who represented different constituencies in the field. A comparison of these groups revealed significant group differences in relation to the perceived value of the program quality indicators.

The procedures used in the field validation of the revised DEC recommended practices were similar to those followed by Meyer et al. (1987) and to those followed in the validation of the original DEC recommended practices (Odom, McLean, Johnson, & LaMontagne, 1995; Odom & McLean, 1996). Two major questions were posed: (1) To what extent do key stakeholders in early intervention agree that practices generated through the literature review and focus groups should be recommended practices for the field?; and (2) To what extent do key stakeholders report that practices generated through the literature review and focus groups are used in programs with which they are familiar?

Method

Respondents

Practitioners, parents, and higher education professionals/administrators were selected as the three stakeholder groups to comprise the validation sample. Recruitment of stakeholders was accomplished in several ways. First, volunteers who represented the various stakeholder groups were solicited at the annual DEC conference and through a notice published in *Young Exceptional Children.* The DEC Family Consortium Committee also assisted with the identification of parents who might be willing to complete a validation questionnaire. A total of 211 individuals volunteered: 78 practitioners, 62 from higher education, 46 administrators and 25 parents. The targeted numbers for each of these stakeholder groups was consistent with the numbers from the original validation of DEC recommended practices: 400 practitioners, 200 from higher education/administration, and 200 parents. The greater number of practitioners identified was a reflection of the desire to have those who would be implementing the practices strongly represented. To get a total of 400 practitioners, 322 names were randomly selected from the DEC membership list to add to the 78 volunteers. To complete the higher education/administration group 92 names were selected from a list of currently funded personnel preparation projects and a list of Part C/619 coordinators for the states and territories. To complete the parents group, 175 names were randomly selected from the mailing list of the Federation of Children with Special Needs. A cross check was completed with the lists of individuals who had participated in the first two stages of this project so that those individuals involved in the development of the practices were not included in the validation.

Validation Questionnaire

A questionnaire was developed for the field validation that asked respondents to rate each practice according to the following two questions: (1) Is this a recommended practice?; and (2) To what extent is this practice followed by programs with which you are familiar? Due to the large number of recommended practices generated from the literature review and focus group synthesis (n=250), two forms of the validation questionnaire were created by assigning odd-numbered items to Form A and even-numbered items to Form B. Each respondent received either Form A or Form B with 125 practices to validate. On each form, the practices were organized by strand.

Figure 1 includes a sample of the first three items in the Assessment strand from Form B. Respondents used a Likert-type scale with ratings of *strongly agree* (1), *agree* (2), *disagree* (3), and *strongly disagree* (4) or *undecided* (?) to indicate whether the practice should be considered as a recommended practice. A Likert-type scale was also used to rate current use with categories of *frequently* (1), *sometimes* (2), *rarely* (3), *never* (4) and *undecided* (?).

Procedures

Participants were mailed a validation questionnaire and a letter that asked them to return the questionnaire unanswered if they thought they did not have the background or experience to respond to the items or if they could not respond within 1 month. The initial mailing to respondents was followed 1 month later by a postcard reminder with a second postcard reminder mailed approximately 1 month after the first.

Results

Thirty-eight of the 800 surveys mailed were returned unanswered; yielding an adjusted sample size of 762. Based on this number, a return rate of 51% (n = 388) was obtained (211 practitioners, 55 parents, and 122 higher education/administrators). The mean years of experience for respondents was 14.23 years with a range from .5 year to 39 years. Of the respondents, 91 characterized themselves as primarily involved in 0-3 services, 107 characterized themselves as primarily preschool, 122 identified themselves with a 0-5 age range and 68 indicated "other" or did not indicate any particular age group.

Recommended practice

The criterion used to determine whether a practice should be considered to be a validated recommended practice was that more than 50% of the respondents to a particular item indicated *strongly agree* or *agree* in response to the statement "This is a recommended practice." All 250 practices included in Form A and Form B of the survey met this criterion. Table 1 lists the frequency of responses to this first question on the questionnaire. These data have been aggregated by strand for presentation.

Current Use

Table 2 shows the results of the current use rating on the questionnaire, aggregated by strand. Ratings of *frequently* ranged from a low of 17% (Technology) to a high of 32% (Assessment). Ratings of *sometimes* ranged from 38% (Assessment, Policy and Systems Change, and Personnel) to 50% (Family-Based). Ratings of *rarely* ranged from 17% (Child-Focused) to 26% (Technology). Ratings of *never* ranged from 2% (Family-Based and Interdisciplinary) to 5% (Technology). Missing data included items left blank (not rated) and those where *undecided (?)* was circled. Missing data ranged from 5% (Assessment and Family-Based) to 16% (Personnel).

Comparison of respondent groups

Mean ratings were computed for practitioners, parents and higher education/administration personnel for each strand to determine whether differences in ratings existed across the groups. Separate, one-way ANOVA's were conducted to examine differences. The p critical value was adjusted according to the Bonferroni formula to adjust for experiment-wise error; the adjusted value was .007. Tukey post hoc analyses were conducted to determine the direction of the difference when a significant main effect occurred.

Table 3 shows the ANOVA results across the three groups (practitioners, parents and administrators/higher education personnel) for each strand for the rating of recommended practice. A statistically significant difference was found only in the Child-Focused strand, (F = 5.065). A Tukey post hoc analysis revealed that practitioners (*M*=1.2196; *SD*=.2533) rated the items more favorably (p = .007) than parents (*M*=1.3756; *SD*=.3623). The effect size (Cohen's d) for this difference was .4990, meaning that practitioners and parent ratings differed by almost one-half of a standard deviation unit. Administrators/higher education personnel (*M*=1.2107; *SD*=.2296) also rated child-focused items more favorably (p = .008) than parents (*M*=1.3756; *SD*=.3623). The effect size (Cohen's d) was .5437 meaning that on average, administrators/higher education personnel and parents differed in their ratings by more than half of a standard deviation unit.

Table 4 shows the results of analysis of variance across the three groups for each strand for the ratings of extent of use. As shown in Table 4, no main effects were found for any strands.

Discussion

As indicated above, the criterion for validation of each of the 250 practices was that more than 50% of the respondents to a particular practice would rate *strongly agree* or *agree* in response to whether it represents a recommended practice. All 250 of the practices met this criterion. It can be seen from Table 1 that there were similar patterns of responses across the strands. In every strand, *strongly agree* was the most frequent response followed by *agree* as the second most frequent response. The Family-Based strand had the largest *strongly agree* response at 74%, while the Technology strand had the smallest at 56%. *Disagree* and *strongly disagree* ratings were very infrequent in all strands.

Examining Table 2, several things become apparent. *Sometimes* was the most frequent response to the question of extent of current use for every strand. Also for each strand, *frequently* and *sometimes* responses, taken together, accounted for more than 50% of all responses. *Frequently* was the second most frequent response for all strands with the exception of Technology and Policy and Systems Change where *rarely* was the second most frequent response. *Undecided* ratings and no rating (left blank) for four of the strands (Assessment, Child-Focused, Family-Based, and Interdisciplinary) was 5% to 7% of the responses while for three of the strands (Technology, Policy and Systems Change, and Personnel) "undecided" and missing data was 14% to 16% of the ratings.

Unlike the study by Meyer et al (1987), there was a good deal of agreement across constituent groups in this field validation. A comparison of responses across groups of respondents resulted in a main effect for only the rating of recommended practice and for only one strand, Child-Focused. While all three groups had a majority of *agree* or *strongly agree* responses, the practitioners group and the administration/higher education group both rated the practices more favorably than the parents group. Effect sizes for both of these differences were close to or more than one-half of a standard deviation unit. It is not clear why the parent group did not rate these practices as strongly as the other two groups. It could be speculated that perhaps the terminology used in the strand was less familiar to the parents.

In summary, all of the practices which resulted from the review of research and the focus groups were validated as recommended practices by the respondents surveyed. The data indicate a strong validation of the practices by all three of the respondent groups with a difference in the ratings found for only one of the seven strands. This is different from the validation of the original DEC Recommended Practices where differences were found in agreement for four of eleven strands (McLean & Odom, 1996). On average, the respondents reported seeing these practices in use *sometimes* and even *frequently.* There were no differences between groups for any of the seven strands relative to the rating of frequency of use. Again this is different from the validation of the original DEC Recommended Practices where differences were found in ten of the eleven strands (McLean & Odom, 1996). In summary, the results of this study support the social validity of the revised DEC Recommended Practices on the basis of stakeholder opinion.

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Indicators of Recommended Practice

Assessment

	This is a recommended practice	Extent to which you see this in practice
A2. Professionals ensure a single point of contact for families throughout the assessment process.	SA A D SD ?	F S R N ?
A4. Professionals inform families about state EI/ECSE rules and regulations Regarding assessment.	SA A D SD ?	F S R N ?
A6. Professionals solicit information from families regarding the child's Interests, abilities, and special needs.	SA A D SD ?	F S R N ?

Figure 1:

Sample of three items from the validation questionnaire, Form B

Table 1

Responses to the recommended practice question

Strand	Strongly Agree	Agree	Disagree	Strongly Disagree	? or No Response
Assessment	70%	24%	2%	.3%	3%
(49 items/8,997 responses)	(n=6,313)	(n=2,181)	(n=245)	(n=29)	(n=229)
Child-Focused	72%	21%	2%	.1%	4%
(28 items/5,138 responses)	(n=3,724)	(n=1,099)	(n=84)	(n=7)	(n=224)
Family-Based	74%	22%	1%	.09%	3%
(19 items/3,493 responses)	(n=2,595)	(n=765)	(n=38)	(n=3)	(n=92)
Interdisciplinary	71%	23%	2%	.1%	4%
(19 items/3,495 responses)	(n=2,497)	(n=790)	(n=79)	(n=4)	(n=125)
Technology	56%	34%	3%	.5%	6%
(22 items/4,037 responses)	(n=2,270)	(n=1,391)	(n=100)	(n=19)	(n=257)

Table 1 (continued)

Policy and Systems Change	64%	27%	2%	.3%	7%
(44 items/8,074 responses)	(n=5,184)	(n=2,203)	(n=130)	(n=21)	(n=536)
Personnel	64%	27%	2%	.2%	7%
(69 items/12,669 responses)	(n=8,087)	(n=3,477)	(n=248)	(n=22)	(n=835)

Table 2

Responses to Extent of Use Rating

Strand	Frequently	Sometimes	Rarely	Never	? or No Response
Assessment	32%	38%	22%	3%	5%
(49 items/9,429 total responses)	(n=3059)	(n=3,610)	(n=2,041)	(n=287)	(n=432)
Child-Focused	31%	43%	17%	3%	7%
(28 items/5,310 total responses)	(n=1,625)	(n=2,307)	(n=882)	(n=148)	(n=348)
Family=Based	25%	50%	19%	2%	5%
(19 items/3,579 total responses)	(n=884)	(n=1,795)	(n=666)	(n=52)	(n=182)
Interdisciplinary	29%	41%	23%	2%	6%
(19 items/3,577 total responses)	(n=1,034)	(n=1,458)	(n=815)	(n=73)	(n=197)
Technology	17%	39%	26%	5%	14%
(22 items/4,135 total responses)	(n=693)	(n=1,599)	(n=1,069)	(n=208)	(n=566)

Table 2 (continued)

Policy and Systems Change	19%	38%	25%	3%	14%
(44 items/8,267 total responses)	(n=1,580)	(n=3,168)	(n=2,089)	(n=266)	(n=1,164)
Personnel	23%	38%	20%	4%	16%
(69 items/12,979 total responses)	(n=3,029)	(n=4,869)	(n=2,539)	(n=456)	(n=2,086)

Table 3

Mean Rating[1] by Respondent Groups:

Is this a recommended practice?

	Means			
Strand	Practitioners	Parents	Admin./ Higher Ed.	ANOVA
Assessment (n = 236/388)	1.2806 (SD= .2382)	1.4269 (SD= .4193)	1.2720 (SD= .2216)	n.s.
Child-Focused (n = 258/388)	1.2196 (SD= .2533)	1.3756 (SD= .3623)	1.2107 (SD= .2296)	5.065[2]
Family-Based (n = 338/388)	1.2756 (SD= .3492)	1.2206 (SD= .3931)	1.1681 (SD= .2593)	n.s.
Interdisciplinary (n = 301/388)	1.2906 (SD= .3265)	1.2778 (SD= .4246)	1.2306 (SD= .2734)	n.s.
Technology (n = 270/388)	1.4583 (SD= .4352)	1.3750 (SD= .4149)	1.3383 (SD= .3389)	n.s.
Systems Change (n = 235/388)	1.2947 (SD= .3181)	1.2796 (SD= .3905)	1.2439 (SD= .2985)	n.s.

Table 3 (continued)

Personnel Dev. (n = 220/388)	1.2877 (SD= .3109)	1.2979 (SD= .3948)	1.1990 (SD= .2474)	n.s.

---

[1] Rating Scale

1 = strongly agree

2 = agree

3 = disagree

4 = strongly disagree

[2] $p = .0070$

Table 4

Mean Rating[1] by Respondent Groups:

To what extent do you see this practice?

	Means			
Strand	Practitioners	Parents	Admin./ Higher Ed.	ANOVA (significance)
Assessment (n = 210/388)	1.8831 (SD= .4466)	1.9770 (SD= .5091)	2.0617 (SD= .4658)	n.s.
Child-Focused (n = 236/388)	1.8175 (SD= .4593)	1.9235 (SD= .5377)	1.9759 (SD= .4527)	n.s.
Family-Based (n = 313/388)	1.9143 (SD= .5210)	2.0209 (SD= .6352)	2.0275 (SD= .5159)	n.s.
Interdisciplinary (n = 276/388)	1.9013 (SD= .4902)	2.0688 (SD= .6691)	1.9944 (SD= .5064)	n.s.
Technology (n = 199/388)	2.2233 (SD= .5570)	2.5070 (SD= .6470)	2.2208 (SD= .4632)	n.s.
Systems Change (n = 175/388)	2.1218 (SD= .4382)	2.137[illegible] (SD= .6438)	2.1196 (SD= .4975)	n.s.

Table 4 (continued)

Personnel Develop. (n = 159/388)	2.1133 (SD= .4585)	2.2104 (SD= .5542)	1.9470 (SD= .3721)	n.s.

---

[1] Rating Scale

1 = Frequently

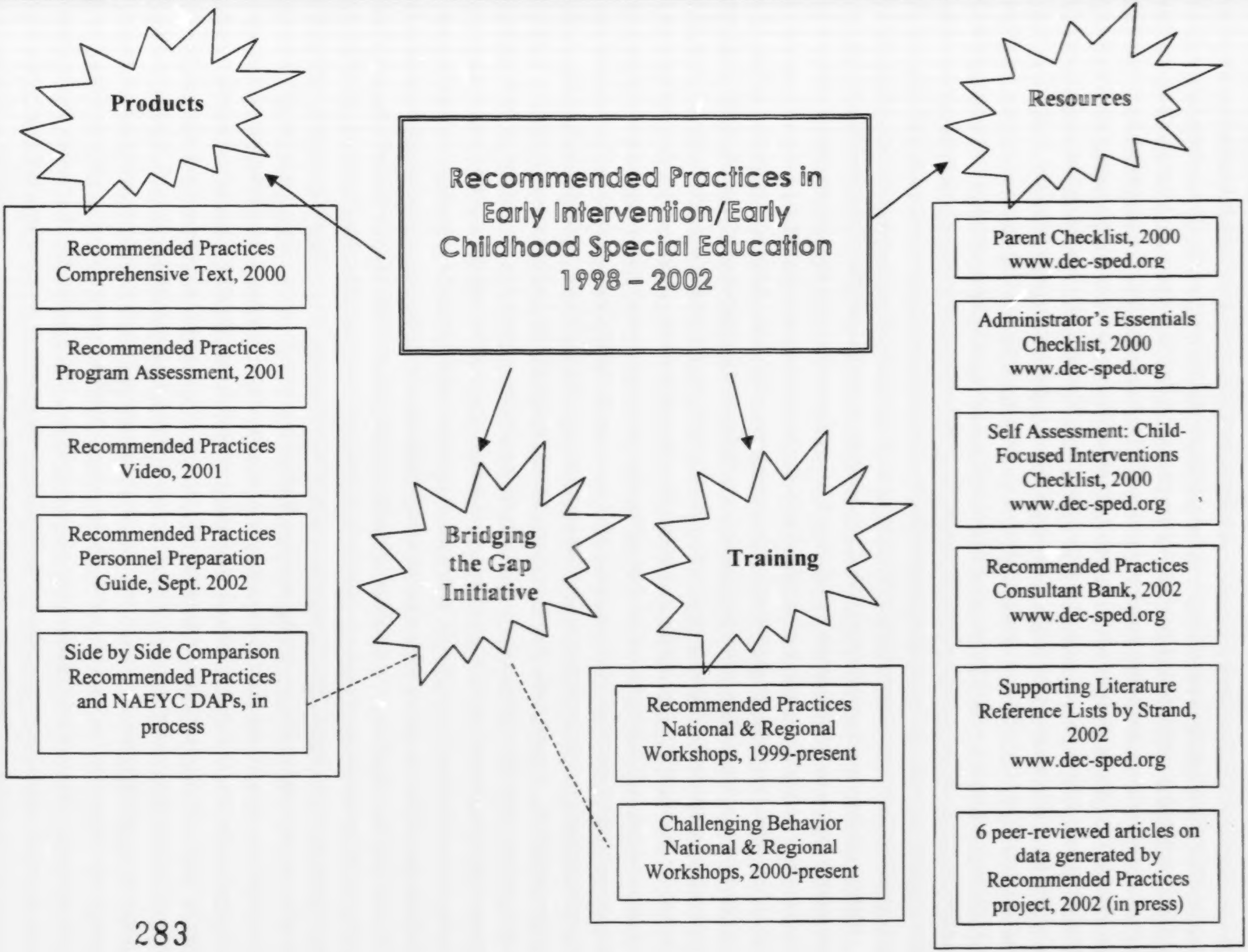
2 = Sometimes

3 = Rarely

4 = Never

Appendix D

Products, Web Site, and Training



Recommended Practices in Early Intervention/Early Childhood Special Education 1998 – 2002

Products

- Recommended Practices Comprehensive Text, 2000
- Recommended Practices Program Assessment, 2001
- Recommended Practices Video, 2001
- Recommended Practices Personnel Preparation Guide, Sept. 2002
- Side by Side Comparison Recommended Practices and NAEYC DAPs, in process

Bridging the Gap Initiative

Training

- Recommended Practices National & Regional Workshops, 1999-present
- Challenging Behavior National & Regional Workshops, 2000-present

Resources

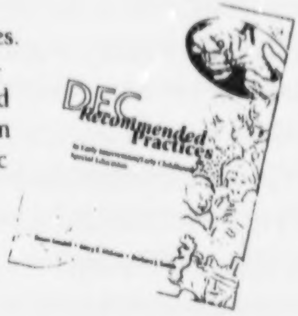
- Parent Checklist, 2000 www.dec-sped.org
- Administrator's Essentials Checklist, 2000 www.dec-sped.org
- Self Assessment: Child-Focused Interventions Checklist, 2000 www.dec-sped.org
- Recommended Practices Consultant Bank, 2002 www.dec-sped.org
- Supporting Literature Reference Lists by Strand, 2002 www.dec-sped.org
- 6 peer-reviewed articles on data generated by Recommended Practices project, 2002 (in press)

DEC Recommended Practices Series

DEC Recommended Practices in Early Intervention/Early Childhood Special Education

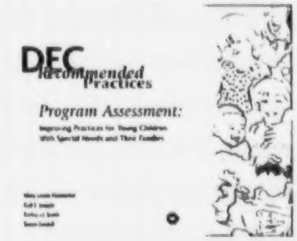
Birth to Age 5

This resource bridges the gap between research and practice, offering much-needed guidance to parents and professionals who work with young children with disabilities. *Recommended Practices* outlines how families and educators can improve the development and learning outcomes for these children and the different meanings associated with those outcomes, including improved social competence, independence, problem solving, and enhanced family functioning. *Recommended Practices* covers various topic areas, including: Assessment; Child-Focused Practices; Family-Based Practices; Interdisciplinary Models; Technology Applications; Policies, Procedures, and Systems Change; and Personnel Preparation. **DCS143REC, $20.00**



DEC Recommended Practices Program Assessment:

Improving Practices for Young Children With Special Needs and Their Families



Birth to Age 5

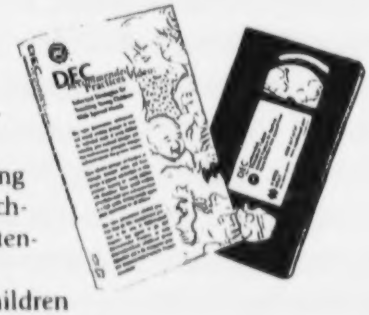
A companion to *DEC Recommended Practices in Early Intervention/Early Childhood Special Education*, this resource will help you assess and improve the quality of services you provide to young children with disabilities and to their families. Learn to evaluate direct services and indirect supports, based on the recommended practices; determine the strengths and needs of your program; and much more. Includes reproducible Program Assessment, Summary, and Action Planning forms. **DCS143ASSESS, $20.00**

DEC Recommended Practices Video

Selected Strategies for Teaching Young Children With Special Needs

Ages 2–5

This video demonstrates different learning environments and teaching procedures from *DEC Recommended Practices in Early Intervention/Early Childhood Special Education*, and *DEC Recommended Practices Program Assessment*, including peer-mediated strategies, consequences, prompting strategies, naturalistic teaching procedures, and much more. These effective strategies are based on an extensive literature review and information gleaned from focus groups of parents, teachers, and administrators about what best promotes learning for young children with special needs. **DCS143VID, $20.00**



Personnel Preparation in Early Childhood Special Education: Implementing the DEC Recommended Practices

This publication provides guidance for faculty in higher education and for professional development specialists on the application of the DEC Recommended Practices in Personnel Preparation. Includes case studies from a variety of preservice and inservice programs that provide specific examples of implementation of the DEC Recommended Practices. **(expected publication date: September 2002)**

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The **Division for Early Childhood (DEC)** of the Council for Exceptional Children (CEC) is a nonprofit organization advocating for individuals who work with or on behalf of children with special needs, birth through age eight, and their families. Founded in 1973, the Division is dedicated to promoting policies and practices that support families and enhance the optimal development of children. Children with special needs include those who have disabilities, developmental delays, are gifted/talented, and are at risk of future developmental problems.

Effective July 1, 2002

The DEC Executive Office's new contact information:

Sarah A. Mulligan, Executive Director
The Division for Early Childhood
634 Eddy
Missoula, Montana 59812-6696

Phone 406.243.5898
Fax 406.243.4730
Email dec@selway.umt.edu

NEW DEC News

Nominate someone for a DEC Award! Deadline is September 9, 2002.
More information

Nominate someone to serve on the DEC Executive Board.
Deadline is September 9, 2002.
More information

DEC 2002 - The 18th Annual Conference
on Young Children with Special Needs and Their Families
December 5-8, 2002 San Diego, CA
More information

Conferences and Meetings		DEC Recommended Practices	DEC Recommended Practices

Young Exceptional		DEC Subdivisions	
Journal of Early		DEC Executive Board, Committee Chairs & Editors	
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Awards		Governmental Information & Children's Action Network	

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DEC Recommended Practices in Early Intervention/ Early Childhood Special Education

TABLE OF CONTENTS

- Overview of Initiative
- Bridging the Gap Initiative
- Recommended Practices Product Line
- Reproducible Checklists
- Literature Sources
- Recommended Practices Consultant Bank

RECOMMENDED PRACTICES INITIATIVE

The **DEC Recommended Practices Project** synthesized the knowledge found in the scientific/professional literature and the knowledge from experience of parents, practitioners and administrators about those practices that produce the best outcomes for children. This set of recommended early intervention/early childhood special education practices is now available in several formats including a book, a self-assessment guide and a video. Please see the Products section for more information.

Funded by the Office of Special Education Programs, U.S. Department of Education

BRIDGING THE GAP INITIATIVE

The **Bridging the Gap** Initiative was developed to provide a model to move the DEC Recommended Practices into **actual practice** in order to implement and sustain high quality services to children and families.

This model will facilitate the sustained use of the identified practices through training and systems change procedures. The model is being developed and implemented in two early childhood sites with the goal being to build the sites' capacity to implement the practices over time. The model, materials and outcomes at the sites are evaluated on an ongoing basis for improvement and revision. We will disseminate the model and findings through DEC and partner national organizations.

PRODUCTS

DEC Recommended Practices in Early Intervention/Early Childhood Special Education

Sandall, McLean, Smith (Eds.) (2000)

Sandall, McLean, Smith (Eds.) (2000)

Ages Birth through Age 5

This resource bridges the gap between research and practice, offering much-needed guidance to parents and professionals who work with young children with disabilities. *Recommended Practices* outlines how families and educators can improve the development and learning outcomes for these children and the different meanings associated with those outcomes, including improved social competence, independence, problem solving, and enhanced family functioning. *Recommended Practices* covers the following seven topic areas:

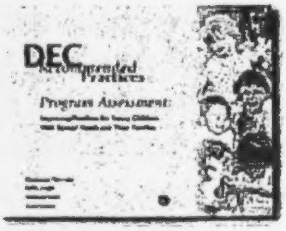
- Assessment - Neisworth & Bagnato
- Child-Focused Interventions - Wolery
- Family-Based Practices - Dunst & Trivette
- Interdisciplinary Models - McWilliam
- Personnel Preparation - Stayton & Miller
- Policies, Procedures, and Systems Change - Harbin & Salisbury
- Technology Applications - Stremel

**To order, please see Sopris West's website at www.sopriswest.com or call 800-547-6747.
Cost: $20.00**

NEW!

DEC Recommended Practices Program Assessment: Improving Practices for Young Children With Special Needs and Their Families

Hemmeter, Joseph, Smith, Sandall (Eds.) (2001)



Ages Birth through Age 5

A companion to *DEC Recommended Practices in Early Intervention/Early Childhood Special Education*, this resource will help you assess and improve the quality of services you provide to young children with disabilities and to their families. The assessment is appropriate for Head Start, child-care centers, public schools, or other early childhood programs that implement developmentally appropriate classrooms and curricula.

Use this assessment to:

- Evaluate direct services and indirect supports, based on the recommended practices.
- Determine the strengths and needs of your program.
- Evaluate the impact of training, technical assistance, and other interventions.
- Identify professional development needs of staff.

Includes reproducible Program Assessment, Summary, and Action Planning forms.

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Ages 2 through 5

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- consequences
- prompting strategies
- environments that promote learning

These effective strategies are based on an extensive literature review and information gleaned from focus groups of parents, teachers, and administrators about what best promotes learning for young children with special needs.

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Personnel Preparation in Early Childhood Special Education: Implementing the DEC Recommended Practices

This publication provides guidance for faculty in high education and for professional development specialists on the application of the DEC Recommended Practices in Personnel Preparation. Includes case studies from a variety of preservice and inservice programs that provide specific examples of implementation of the DEC Recommended Practices.

(Expected publication date: September 2002)

REPRODUCIBLE CHECKLISTS

The following checklists are offered as examples of ways that individuals or teams might use the Recommended Practices to guide program development or evaluation. Readers are encouraged to design their own checklists or discussion guides that focus on their particular program development needs and concerns. The checklists come from *DEC Recommended Practices in Early Intervention/Early Childhood Special Education* (Sandall, McLean and Smith, 2000).

These checklists are in Adobe PDF format and can be downloaded and copied without permission - distribution is encouraged!

Parent Checklist

Self-Assessment: Child-Focused Interventions

Administrator's Essentials

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DEC RECOMMENDED PRACTICES LITERATURE SOURCES

Research published in peer-reviewed professional journals from 1990 through 1998 was included in the literature review. Forty-eight journals relevant to the field of EI/ECSE were selected and reviewed (list of journals). The criteria used to determine if an article would be included in the study were that the article (a) must be an original research report and (b) involved children with disabilities, birth through 5, families of children with disabilities birth through 5, personnel who serve them, or policies and systems change procedures that support effective practice with this population. Each article that met these criteria was analyzed for major aspects of research design and results and assigned to a category or "strand" of practice. Some articles were determined by reviewers to support more than one strand.

The literature review along with the results of focus groups of parents, practitioners and administrators produced a thoroughly supported synthesis of research and experienced-based knowledge about EI/ECSE practices for young children with disabilities birth through 5 and their families. This synthesis of evidence-based practices resulted in the 240 DEC Recommended Practices. The references for the articles included in the synthesis are offered here and are categorized by the "strand" of practice they were determined by reviewers to relate to.

- **List of all Journals**

Literature Lists:

- **Assessment Strand**
- **Child-Focused Practices Strand**
- **Family-Based Practices Strand**
- **Interdisciplinary Models Strand**
- **Technology Applications Strand**
- **Personnel Preparation Strand**
- **Policies, Procedures and Systems Change Strand**

DEC RECOMMENDED PRACTICES CONSULTANT BANK

As a service to the field, DEC has created a Recommended Practices Consultant Bank. The members of this group have been nominated by the Recommended Practices Strand Chairs as experts in a specific Recommended Practices strand. These consultants may be able to provide training and technical assistance on the DEC Recommended Practices on a particular topic.

DEC's only involvment is providing these names. Fees and specific arrangements must be made directly between the requester and the consultant as a private consultation request. Please choose one of the following strands to view the list of consultants for that topic:

- Assessment
- Child-Focused Practices
- Family-Based Practices
- Interdisciplinary Models
- Technology Applications
- Personnel Preparation
- Policies, Procedures and Systems Change

DEC encourages the exchange of diverse opinions. The consultants are expressing their own opinions and expressions of fact which are not necessarily those of DEC, nor have they been endorsed or reviewed for accuracy by DEC.

Accordingly, DEC assumes no liability, loss or risk which may be incurred as a consequence, directly or indirectly, to the use and application of any such facts and opinions.

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Recommended Practices/Bridging the Gap National and Regional* Workshops

Date	Location	# of participants
April 1999	Charlotte (CEC Conference)	approx. 50
December 1999	Washington (DEC Conference)	approx. 150
April 2000	Vancouver (CEC Conference)	100
November 2000	Atlanta (NAEYC Conference)	100
December 2000	Albuquerque (DEC Conference)	100
May 2001	Orlando (National Head Start Association)	75
November 2001	Anaheim (NAEYC Conference)	75
November 2001	Tampa (CEC/TED)	75
December 2001	Boston (DEC Conference)	50
April 2002	New York (CEC Conference)	45
April 2002	Seattle (regional)	20
June 2002	Worcester (regional	90
June 2002	Ogden (regional)	200

* In addition to national and regional workshops, project staff presented workshops in several states.

Appendix E

Focus Group Recommendations

5/99

ADMINISTRATOR RECOMMENDED PRACTICES FOCUS GROUP

Services to Families

- Administrators support FLEX scheduling to enable EL/ECSE providers to accommodate family schedules
- Infrastructure has mission statement which reflects family-centered practices and values
- Administrators engage in shared decision making with families
- Administrators support service delivery models that are different from school-age programs i.e. teachers working in the home
- System has funding to support home visits
- Alternative dispute resolution processes are implemented
- Administrators support practitioners in using adult learning principles
- Administrators facilitate a balance of respecting family-identified outcomes and professional opinion
- Administrative structure supports mentoring/supervision of staff

Services to the child

- Programs have appropriately trained and certified staff
- Administrative structures support hiring and retention of appropriately trained and certified staff

- Administrators are knowledgeable about and can assist access to community resources for children
- Administrators ensure that appropriate IEP/IFSP procedures are followed
- Development of IFSPs/IEP's are outcome-based rather than system based

Cultural/Linguistic

- Administrators ensure availability of translators/interpreters and bilingual programs
- Administrators ensure cultural competence in service delivery through training, staff recruitment, and collaborative efforts with the community

Technology

- System ensures that staff have appropriate technology and training related to the use of the technology
- System ensures that children have appropriate assistive technology

Learning Environments

- Administrators ensure that the physical environment supports development and learning
- Administrative structures support developmentally appropriate environments
- Administrators ensure that services are available in a variety of settings in the community
- Administrators work to ensure the safety of staff who do home visits

Interdisciplinary Models

- System provides adequate training, time and resources for teaming.
- Interdis/transdis models aren't a substitute for adequate numbers of personnel

Policy and Procedures

- System provides adequate fiscal resources to support "appropriate" numbers of supervisors/staff (i.e. ratios) and other administrative duties
- Programs have mission statements, periodically set goals and outcomes and perform on-going evaluation of the outcomes
- Resources and procedures are available for evaluation
- Administrators facilitate shared decision-making with families, staff, etc.
- Administrative structure has funding to support services i.e. team meetings, travel, in-service consultation, in-service, paperwork
- Administrative structure provides support for alternative funding structures: Medicaid waiver, child-care subsidies, blending funds across programs
- The goals of the IFSP/IEP determine the types/amount of services needed i.e. outcomes drive personnel needed

Personnel Development

- Program coordinators/supervisors have training in Early Childhood Education, Early Intervention, Early Childhood Special Education and supervision
- Administration supports "learning" (e.g., inservice, coursework, time etc.)
- Administrators have knowledge of how to access alternative funding structures
- Administrators support on-going staff development plans
- Administrators are affiliated with professional early childhood organizations, encourage staff to maintain their affiliations, and support staff attendance at meetings and conferences to enhance professional growth.

Systems Change

- Administrative structure supports adequate child-staff ratio, group size and case loads

- Interagency agreements are developed, implemented and evaluated on a continual basis
- Structures are in place that support local interagency councils/agreements in communities
- A quality assurance system is in place. Administrators have goals and objectives for program improvement
- Parents and other stakeholders have input into the development and implementation of evaluation systems

Indicators of Recommended Practices: Family Perspectives

1. Professionals' communication, both verbal and written, conveys that professionals consider family members as equal partners in all phases of the early intervention process.

2. Program personnel routinely provide opportunities for adults who have experienced early intervention to exchange information with families.

3. Personnel preparation professionals routinely provide opportunities for adults who have experienced early intervention to be involved in planning and delivering preservice and inservice education.

4. Program administrators ensure that staff development opportunities address practitioners' understanding and attitudes regarding the supports and needs of young children with disabilities and their families.

5. Program personnel provide consistent opportunities for families to share information and support.

6. Program personnel provide each child and family with the necessary services to support full participation in inclusive and natural environments.

7. Professionals work collaboratively with families to identify how each environment, (e.g., home environment, day care environment, early intervention environment, and community environments) promotes or hinders the development and learning of each child.

8. Professionals work collaboratively with families to develop and use a shared terminology during all phases of the intervention process.

9. Professionals work collaboratively with families to plan early for transitions into and out of different family-valued service systems and environments.

10. Professionals work collaboratively with families to identify and understand the policies and procedures that govern reimbursement for service delivery.

11. Professionals work collaboratively with families to identify and remove reimbursement and related barriers to desired service delivery, for example Medicaid reimbursement.

12. Professionals share and explore with families a full range of placement options with family preferences guiding where services are delivered.

13. Professionals work jointly with to routinely monitor child placements in response to changes in child and family needs and circumstances.

14. Professionals work collaboratively with families to identify and access opportunities that promote full participation and membership across multiple community and leisure settings.

15. Families and professionals work together to identify and provide the types and levels of support required for child success across environments.

16. Professionals provide families with the information necessary for families to be informed decision makers.

17. Professional decision-makers and policy developers set an administrative climate that encourages practitioner and family collaboration.

18. Professionals and families work collaboratively to explore all service options and clarify family preferences in the development of the IFSP and IEP.

19. Professionals, families and administrators work together to create a climate where practitioners feel comfortable in sharing their perspectives, even if professional perspectives differ from family perspectives without usurping family decision making.

20. Program personnel provide timely information to families that prepares them for eligibility and service system differences between Part C and Part B.

21. Program administrators ensure that individuals with disabilities participate in developing, delivering and evaluating services to young children with disabilities and their families, for example, by serving on advisory councils, as paid employees, and as mentors to young children with disabilities and their families.

22. Professionals and families work together to identify multiple outcomes of program effectiveness including objective indicators of child change, subjective views of increased membership and community participation , and overall family satisfaction.

23. Families and professionals work together to ensure that family-centered principles and practices are consistent across Part C and Part B.

24. Program personnel engage in multidisciplinary and interagency planning and decision making collaboratively with families.

25. Personnel preparation professionals work collaboratively with families and practitioners in the education of current and prospective personnel.

26. Personnel preparation professionals utilize active strategies consistent with the principles of adult learning in the education of current and prospective personnel.

27. Personnel preparation professionals employ strategies designed to identify personal values and biases as part of the education of current and prospective personnel.

28. Personnel preparation professionals plan and provide follow-up support within service delivery contexts as a key component of the education of current and prospective personnel.

29. Families and professionals work together to access, contribute to, and benefit from current and emerging information and communication technology.

30. Professionals and families collaboratively identify the individual strengths of children and families as the basis for planning and implementing services and supports.

31. Professionals and families collaborate to identify effective strategies for educating administrators and policy makers on their roles in creating climates that support family-centered practices.

Recommended Practices: Practitioners Focus Group

What practices are related to better results for young children with disabilities, their families, and the personnel who serve them?

General Comments

1. Program directors should ensure that service coordination is provided for children and families at the birth to three and the preschool level.

2. Practitioners provide services for children in their natural environments.

3. A single professional/practitioner coordinates services for children and families through the preschool years.

4. Professionals define natural environments in ways that are responsive to family beliefs, needs, and concerns and are consistent with families' lives.

5. Practitioners offer families program options and descriptions of those options from which families can define and determine their natural environments.

6. Professionals who provide preservice and inservice preparation should encourage awareness and knowledge of a wide range of options for service delivery, settings, and arrangements.

7. Practitioners should plan for and provide IEP/IFSP processes that allow for open discussion of the family's usual routines and the possibilities for service delivery options and settings that are consistent with or complement family routines.

8. Practitioners should collaborate across all agencies who can and do provide services to children and families.

9. Program personnel provide advocacy and support services (i.e., a helpful and knowledgeable person) that are available to families before, during, and after transition points (before age 3, into kindergarten, into first grade/primary class).

10. Program personnel have ongoing systems change mechanisms in place in order to be responsive to families and communities.

11. Professionals in preservice and inservice preparation should include information on family centered care.

12. Professionals in preservice and inservice preparation should include families in a variety of ways in their preparation programs.

13. Practitioners maintain and expand their skills and knowledge by taking continuing education courses and other learning experiences.

14. Practitioners provide families with complete and unbiased information so that they can make informed choices. Choices are genuine and choices are respected.

15. Program personnel provide staff development activities that include self evaluation (of individual needs and program needs), incorporate principles of adult learning, and encourage reflective practice.

16. Program personnel have systems of accountability in place for individual staff members and the program as a whole.

17. Program personnel use program standards.

18. Program personnel monitor use of program standards.

19. Program personnel strive for accreditation of their program through DEC (or other accrediting agency/organization).

20. State personnel (or other appropriate individuals/teams) evaluate programs against program standards on a regular basis.

21. Practitioners demonstrate skills and knowledge that are appropriate to the age group that they serve.

22. State personnel ensure that a coordinated and collaborative system of services is in place for children ages birth -five and their families.

Transition Recommendations

1. Practitioners provide families with current and accurate information about the next environment and services.

2. State or local program personnel develop policy that allows transitions in services and settings be made in response to child and family needs rather than solely in response to the child's 3rd birthday.

3. Program personnel develop policy that ensures that child assessments for the purposes of continuing eligibility or transition are done by individuals and teams who know the child and family.

4. Receiving teachers and other team members should observe the child in familiar settings prior to transition.

5. Program personnel schedule placement meetings or activities so that sending and receiving teams and families have the opportunity to observe and to learn about each other's settings and expectations before the child changes programs.

6. Program personnel demonstrate family centered care and respect throughout the birth - five system(s) of services.

7. State and local program personnel develop policy that allow transitions to occur at times that are consistent with child, family, and community schedules and rhythms.

8. State and local program personnel develop funding policies that are flexible and allow children and families to complete school years or other naturally occurring schedules.

9. State and local program personnel offer a range of service delivery options including itinerant services, inclusive programs, and so forth.

Service Delivery Options for 3-5

1. Program personnel provide service delivery options for preschoolers that are flexible and responsive to child and family needs.

2. Program personnel provide classroom options for preschoolers that include a mix of ages and abilities.

3. Program personnel provide classrooms that are of a class size and teacher-child ratio that are based on sound research.

4. Practitioners plan for and provide opportunities for children to be meaningful members of their classrooms and the larger community.

5. Practitioners use strategies that support membership and inclusion (i.e., minimal use of 'pull out" services, paraeducators support the whole classroom, itinerants follow the community preschool's schedule and calendar, etc.)

6. All early childhood practitioners (general early childhood teachers, early childhood special educators, paraeducators) participate in joint training and other staff development activities.

7. Program personnel ensure that all team members have adequate time for joint planning and problem-solving.

8. State and local program personnel ensure that a range of service delivery options and settings is available and that these are consistent with principles of natural environments/least restrictive environment.

Paraeducator Training

1. Paraeducators participate in training opportunities that allow for continuing development of skills and knowledge (i.e., tiered or leveled training).

2. Paraeducators have opportunities for increased job independence based on increased training.

3. Program personnel provide clear job descriptions (roles, responsibilities, and working relationships).

4. Paraeducators have opportunities for advancement.

5. Teachers and other service providers use effective and appropriate strategies for supervising paraeducators.

6. Professionals in preservice and inservice preparation deliver coursework or other trainings to help teachers supervise paraeducators.

7. Paraeducators follows standards or competencies.

8. State and local program personnel develop and use standards or competencies for paraeducators as a system of accountability.

IEP/IFSP

1. Practitioners use the IEP/IFSP on a regular and frequent basis.

2. Team members write goals and objectives that are meaningful (represent worthwhile child and family outcomes).

3. Team members use measurement systems that allow for measurement of meaningful growth and change.

4. Practitioners recognize the family's knowledge and experience in developing the IEP/IFSP.

5. Practitioners monitor children's progress on goals and objectives on a regular and frequent basis.

6. Team members ensure that program and placement options are discussed and considered as part of the IEP/IFSP process.

7. All team members participate in the IEP/IFSP process.

8. Team members write goals and objectives that are routines-based, functional, and child oriented.

Supports to Families

1. Practitioners provide families with information and access to family support activities through the program and/or other community resources.

2. Service coordinators meet and fulfill the roles and responsibilities of the service coordinator (i.e., not a specific person or discipline).

3. Program personnel encourage meaningful participation of family members through a variety of opportunities and experiences including employment possibilities.

Assessment

1. Practitioners assess children in contexts that are familiar to the child.

2. Practitioners assess children after they have become familiar to the child.

3. Practitioners assess children using tools that are matched to the purpose of the assessment.

4. Families participate in the assessment process. (There are a range of options for participation.)

5. Practitioners may use clinical judgment as part of the assessment.

6. Practitioners use a variety of assessment tools and approaches including direct testing, family report, observation, and so forth.

7. Practitioners select assessment tools and approaches that are appropriate to the child's abilities and the family's priorities.

Other

1. Federal, state, and local program personnel ensure that EI/ECSE is adequately funded.

2. Federal, state, and local program personnel develop funding policies that support services and service arrangements that enhance child and family functioning.

3. Federal, state, and local program personnel ensure that practitioner's caseloads are manageable.

4. Federal, state, and local program personnel provide funding for adaptive equipment, computers, and other technology.

5. Practitioners use instructional and therapeutic strategies that are appropriate, effective (data based), and matched to child and family needs.

6. Practitioners work as team members in delivering EI/ECSE services.

7. Professionals in preservice and inservice preparation provide training in team building and teamwork.

8. Federal, state, and local program personnel provide or obtain funding for transportation for families as needed.

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